



# American Journal of Public Health and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

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Number 1

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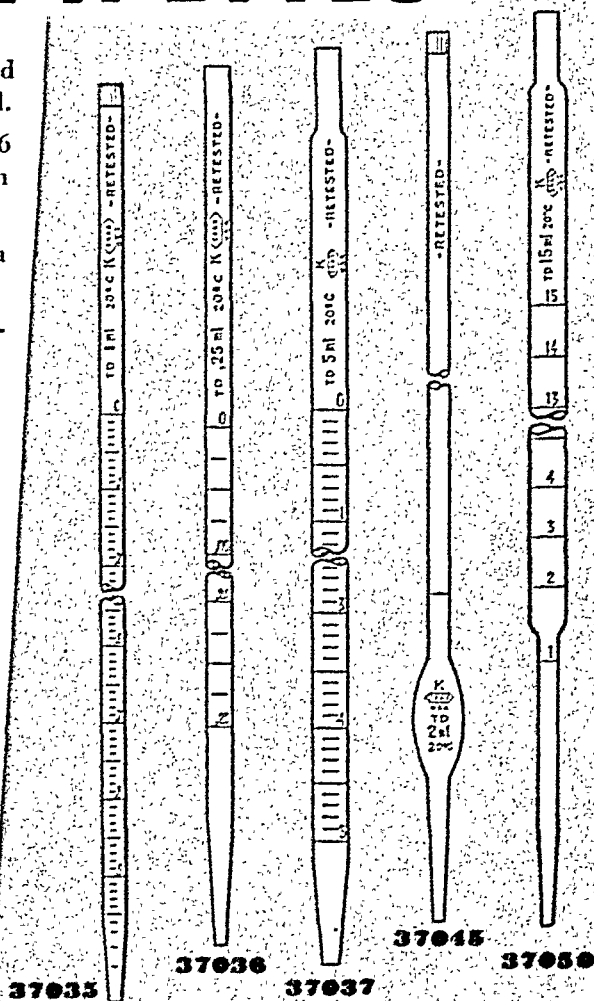
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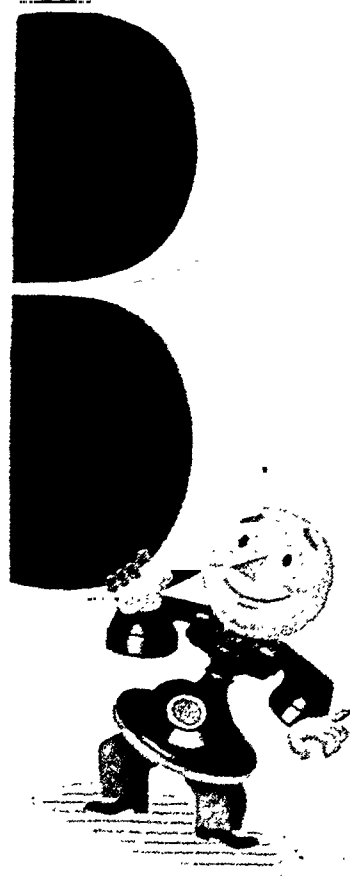
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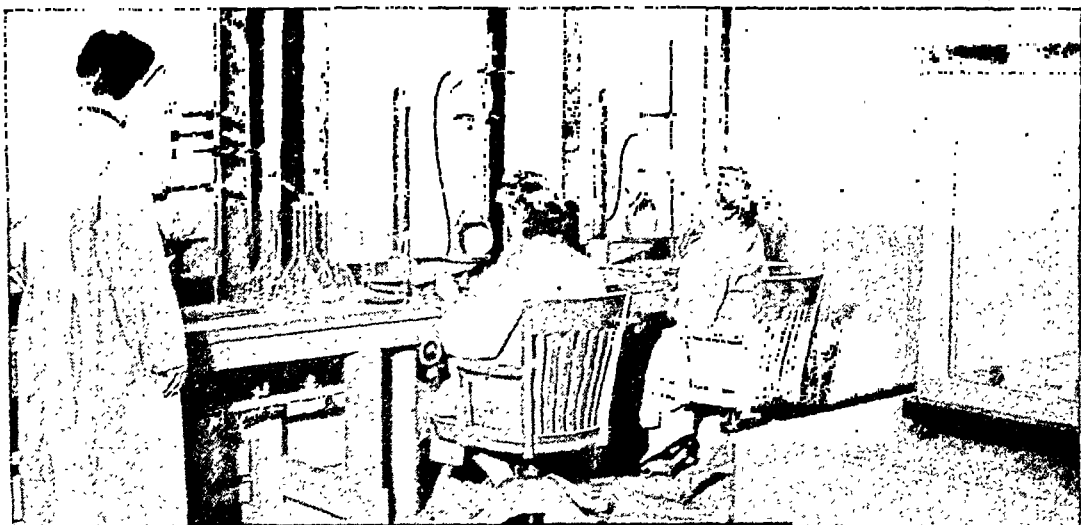
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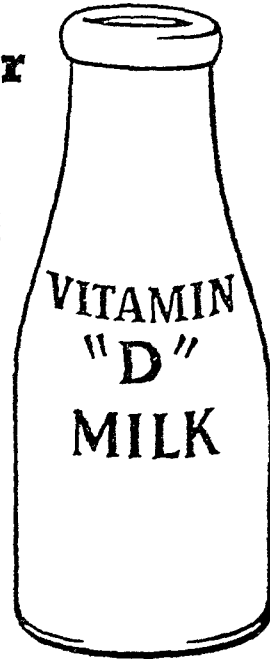
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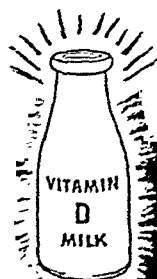
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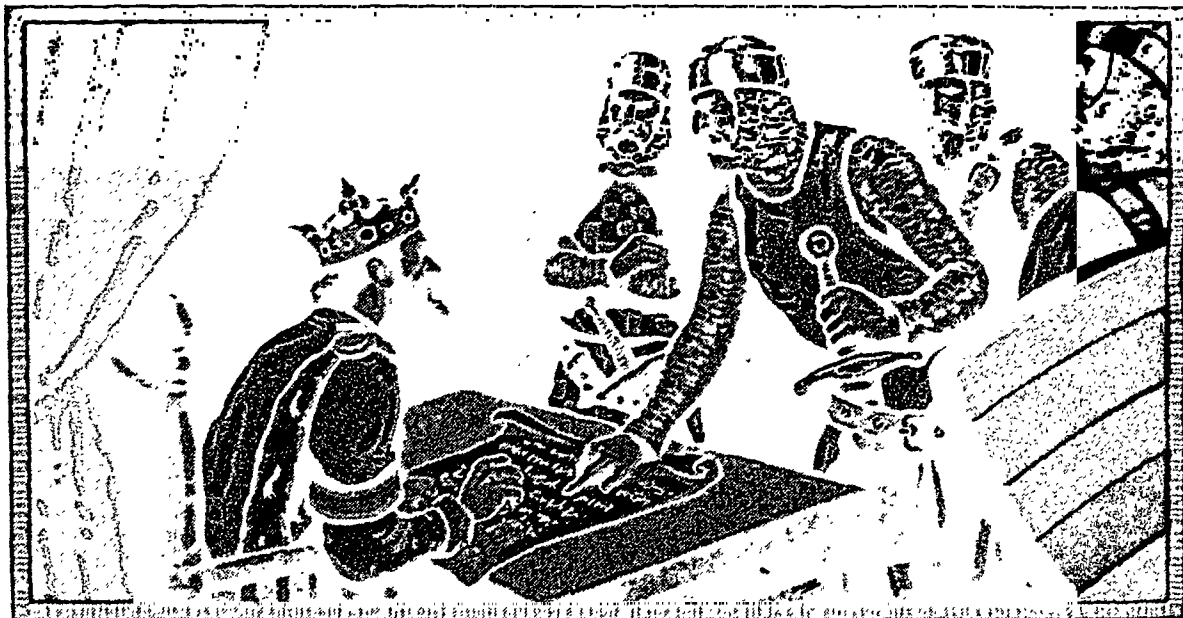
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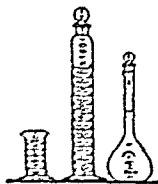
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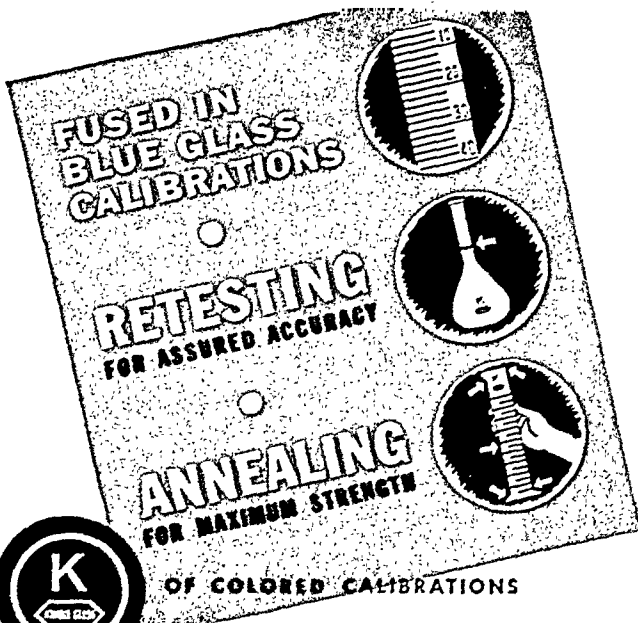
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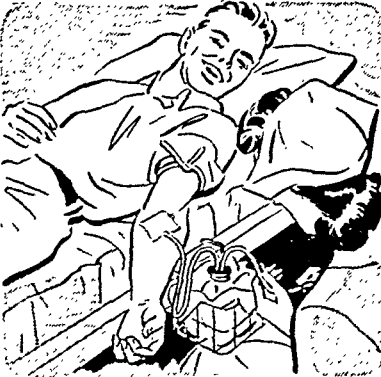
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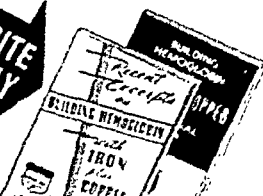
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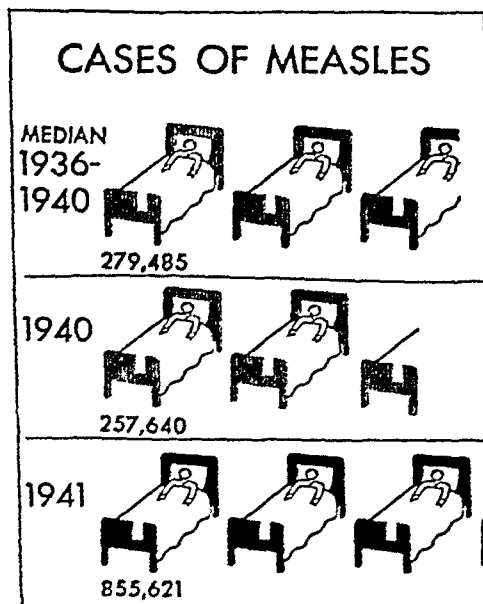
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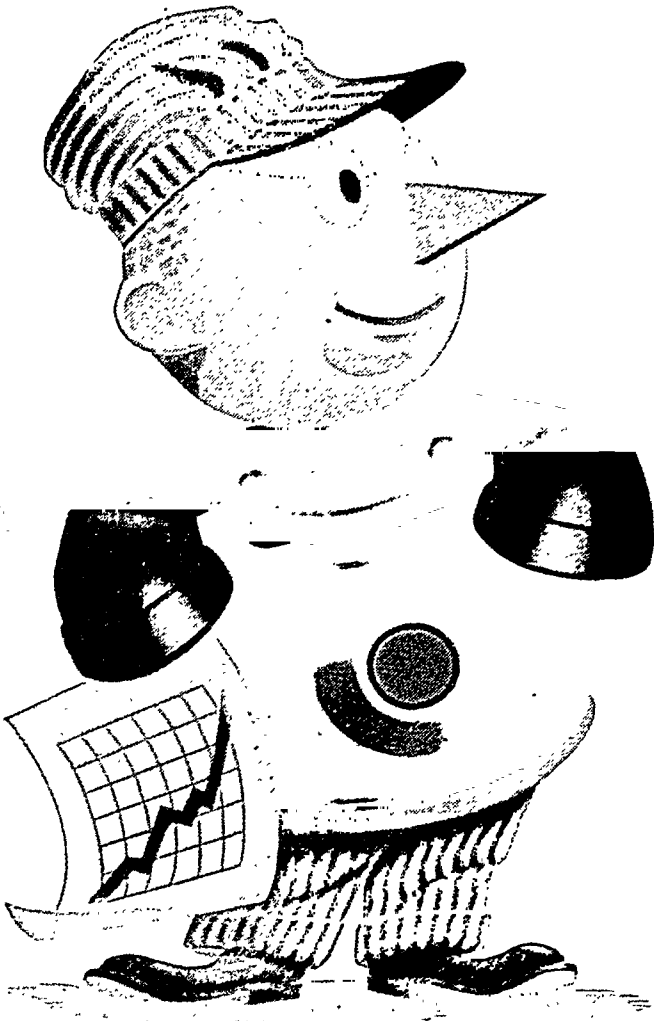
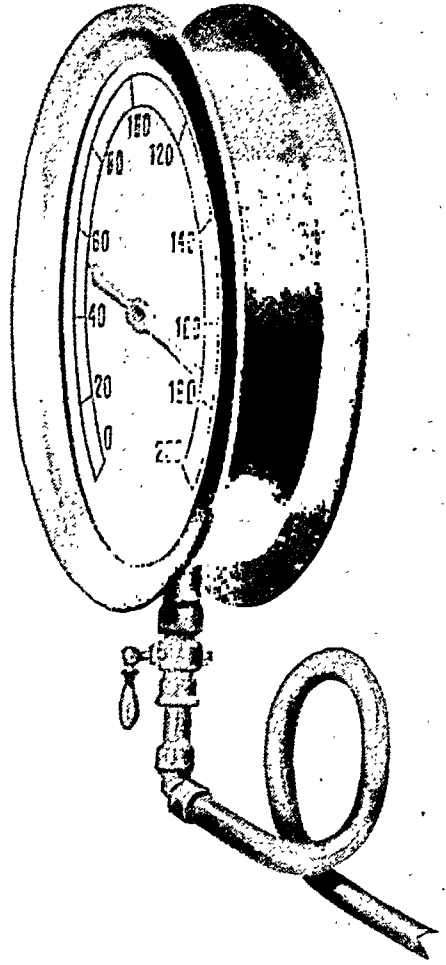
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Elderly persons require just as much protein per pound of body weight as other, younger adults. Unless sufficient protein-rich foods are consumed, the body cannot be maintained in nitrogen equilibrium. Touhy<sup>1</sup> points out that it is practically impossible to keep down weight and avoid overtaxing carbohy-

drate tolerance, unless the dietary of elderly persons provides an adequate amount of proteins. Meat proteins, high in biologic value, are readily converted to the body's needs, and are promptly utilized.

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Because of the marked decrease in salivary ptyalin and pancreatic amylase occurring between 60 and 80 years of age, a high-starch diet, frequently preferred by the elderly because it is easy to chew, may be harmful.<sup>2</sup> Meat stimulates the secretion of digestive juices,<sup>3</sup> thus sharpens the appetite, and improves digestion in general.

1. Touhy, E. L.: A Proper and Adequate Diet for Elderly People, *Minnesota Med.* 23:313 (May) 1940.
2. Meyer, J.: The Management of Diseases of the Gastrointestinal Tract in the Aged, *M. Clin. North America* 24:9 (Jan.) 1940.
3. Boon, W. R.: The action of Meat Extracts and Related Substances as Gastric Stimulants in Man, *Brit. M. J.* 2:412 (Aug. 28) 1937.



*The Seal of Acceptance denotes that the statements made in this advertisement are acceptable to the Council on Foods and Nutrition of the American Medical Association.*

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Official Monthly Publication of the American Public Health Association

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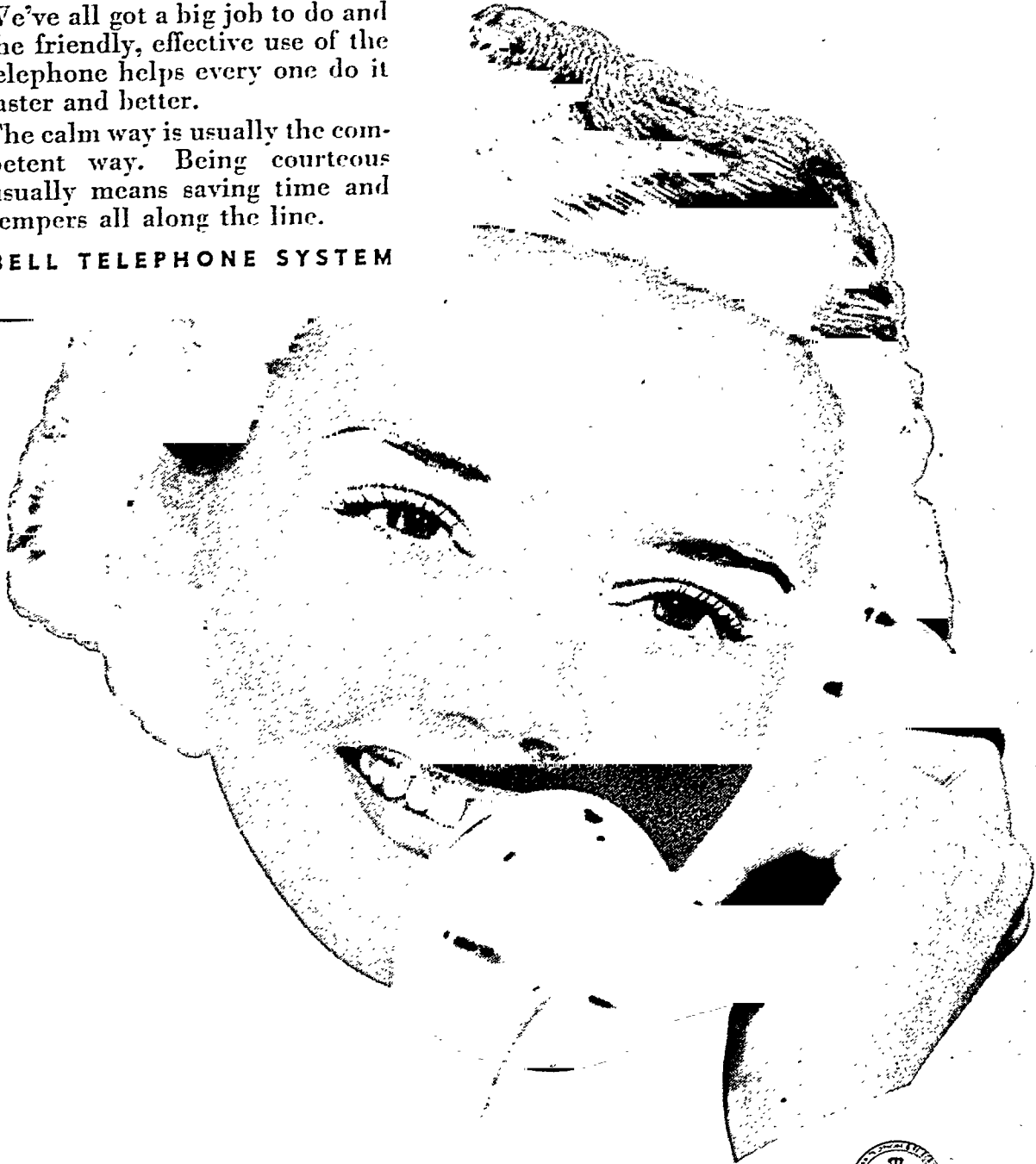
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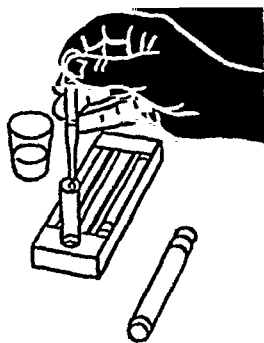
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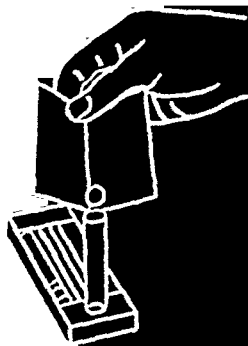
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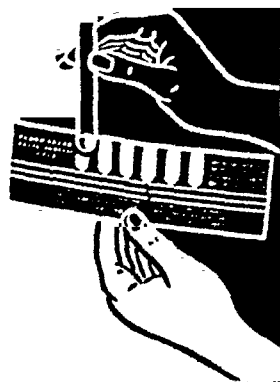
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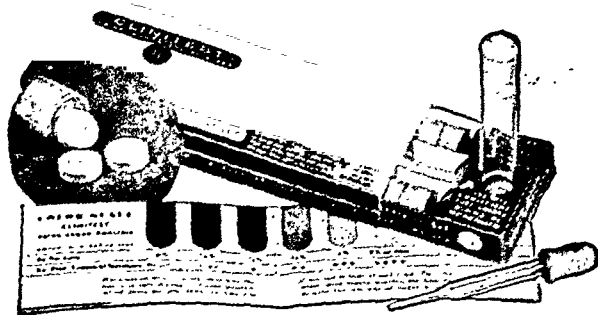
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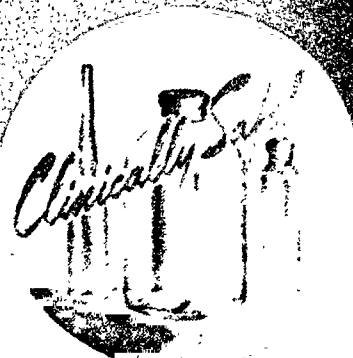
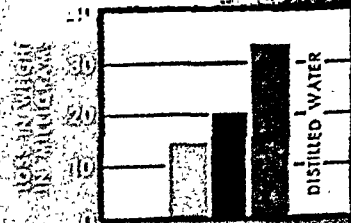
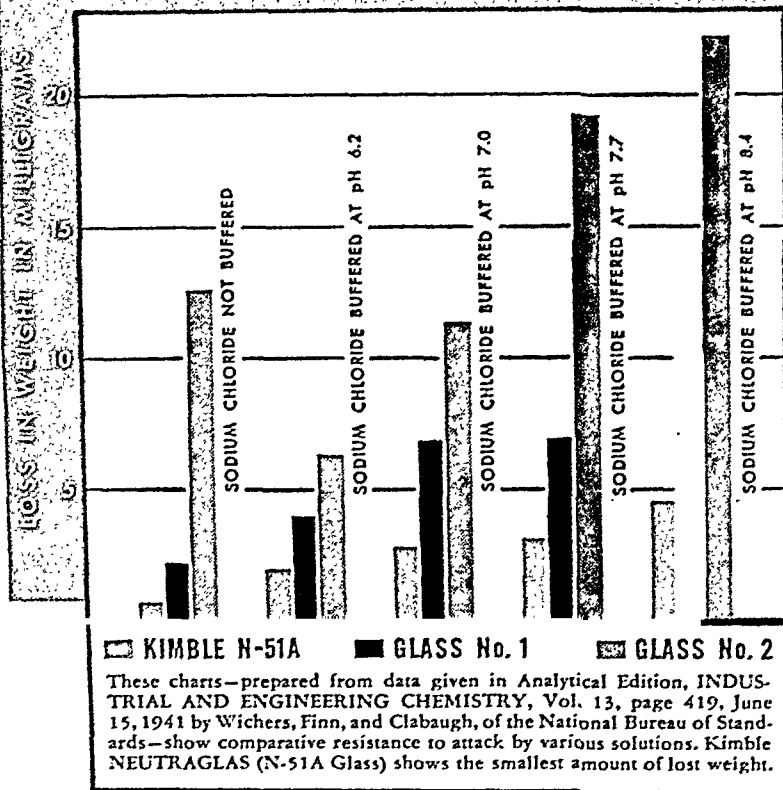
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# The Newer Concepts of Meat in Nutrition

## Meat and the Non-Allergenic Diet

**A**BSORPTION of the intact or incompletely digested protein molecule from the intestinal tract is regarded as the mechanism underlying food allergies. While practically any protein food customarily eaten by man may be responsible for the development of allergic sensitivity, meat appears to be one of the most infrequent offenders.

In a survey in a small community in Virginia, Vaughan\* found that a large percentage of the population was afflicted with sensitivity to certain foods. Only a notably small number, however, mentioned meat as the possible allergen.

In the planning of the non-allergenic

diet, therefore, meat may play a significant role. Meat is a rich source of protein, and is available in such wide variety that some form of meat—beef, veal, lamb, pork, and meat products such as liver, sweetbreads, kidney, etc.—may be safely included in the dietary. This is particularly important since the patient showing allergic reaction to beef may not be sensitive to lamb or the other meats, and vice versa. Since other common protein foods such as eggs, milk, and cereals are the most frequent offenders, it may at times be necessary to make meat almost the only source of required protein.

\*Vaughan, W. P.: *The Practice of Allergy*, p. 63, C. V. Mosby & Co., St. Louis, 1939.



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**American Meat Institute**  
**CHICAGO**

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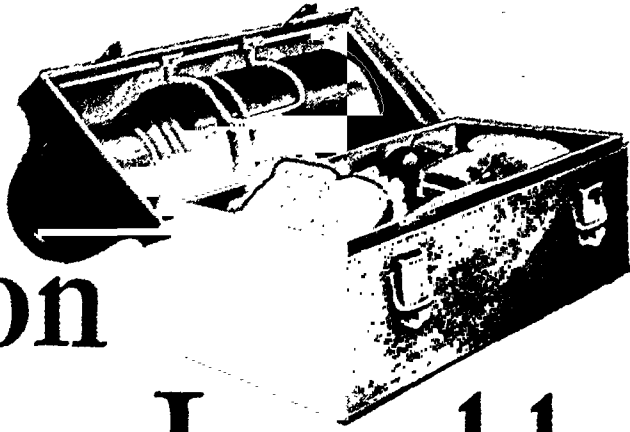
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# Lesson *in a* Lunchbox

**W**HY is it that ever since America was plunged into war people have been eating more bread?

Why is it that "standard equipment" in the lunchboxes of America's hardest workers is *bread*—bread in thick slices, bread in half loaves, bread in sandwiches, or just plain with cheese, meat, perhaps milk or tomatoes?

The answer is in the unquestioned fact that bread is *one of our best energy-foods*. Its high content of carbohydrates makes it a basic element in the diet of people who lead hard-working, active lives.

Today all of us are more active as a result of the war. If we are not actually working at harder jobs in factories, we are doing unaccustomed things that put extra drain on our energy. The businessman on air-raid warden patrol and the woman spending afternoons sewing for the Red Cross both expend more energy than they used to.

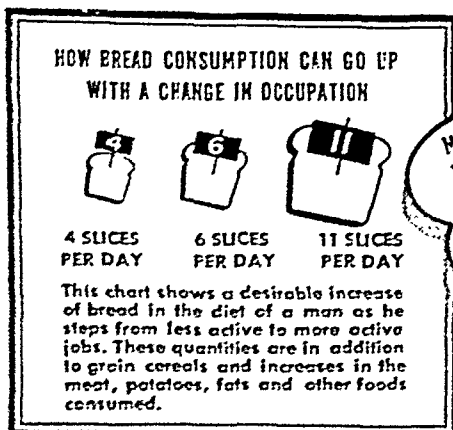
So there's this simple lesson in America's war-factory lunchboxes: *A more active America can well add more bread to its diet.*

Bread is inviting, tempting to the palate, servable in almost countless ways. Especially valuable is the new enriched white bread. While retaining all the preferred flavor, texture and color of white bread, it supplies extra Vitamin B<sub>1</sub>, niacin and iron as recommended by the Food and Nutrition Board of the National Research Council.

A man, stepping from moderately active to active occupation, can very well add two slices per meal to his bread consumption—as well as increasing the meat, potatoes and fats he eats.

Good nutrition fits the diet to the individual *and the occupation*. With all of us becoming more active, new diets are called for.

Base them on bread—for taste appeal, variety, convenience and especially the high food-energy value of this basic food.



**MOST GOOD BREAD IS MADE WITH FLEISCHMANN'S YEAST**  
The yeast used by most of the commercial bakers of the country is Fleischmann's. Many bakers enrich white bread by using Fleischmann's Enriched Hi-B<sub>1</sub> Yeast, thereby insuring an even distribution into every slice of valuable quantities of natural Vitamin B<sub>1</sub>, niacin and iron.

## Bread *is basic*

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\* *The Military Surgeon*, Vol. 89, No. 1, p. 5, July, 1941  
*J. A. M. A.*, 93:1110—October 12, 1929

Brückner, H.—*Die Biochemie des Tabaks*, 1936

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"THE CIGARETTE, THE SOLDIER, AND THE PHYSICIAN," *The Military Surgeon*, July, 1941. Reprint available. Write Camel Cigarettes, Medical Relations Division, 1 Pershing Square, New York City.

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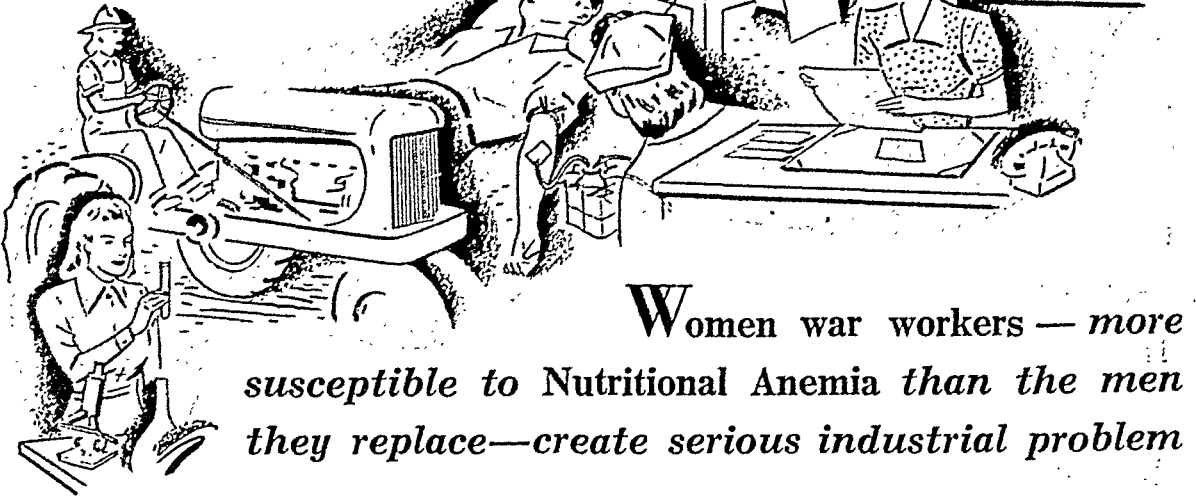
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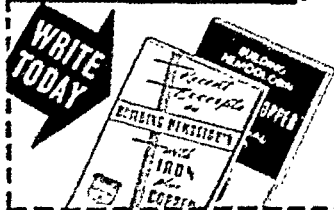
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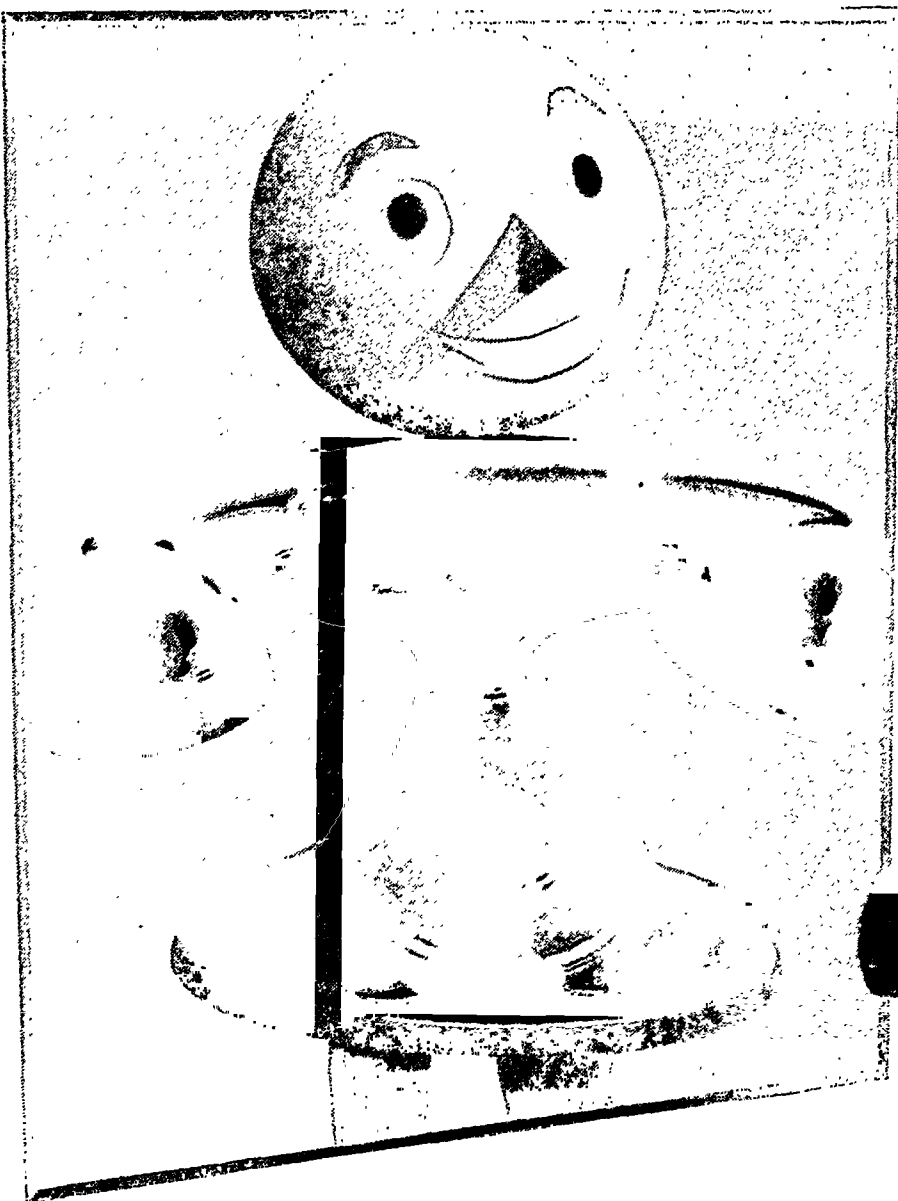


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"But I can't get bigger now because materials are needed for shooting. So I'm asking your help to make the most of what we have.

"Please don't make Long Distance calls to centers of war activity unless they are vital. Leave the wires clear for war traffic."

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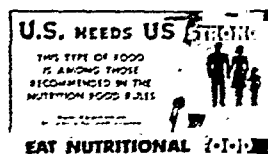
● Be glad that Kellogg Cereals appear so frequently on the tables of so many of the people you are trying to aid in your work for better nutrition. That's one eating habit you won't have to change! For every Kellogg Cereal is made of whole grain, or is restored to whole

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American Can Company, 230 Park Avenue, New York, N. Y.

- (1) 1938, Nutrition Abstracts and Reviews 8, 281  
 (2) 1939, Food and Life: Yearbook of Agriculture  
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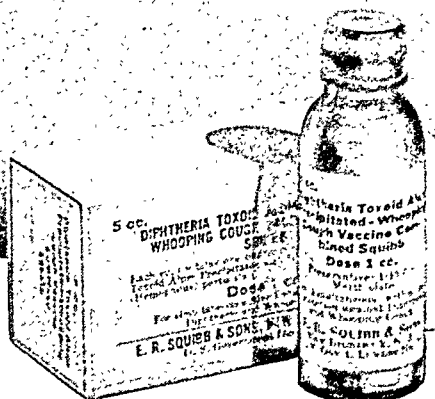
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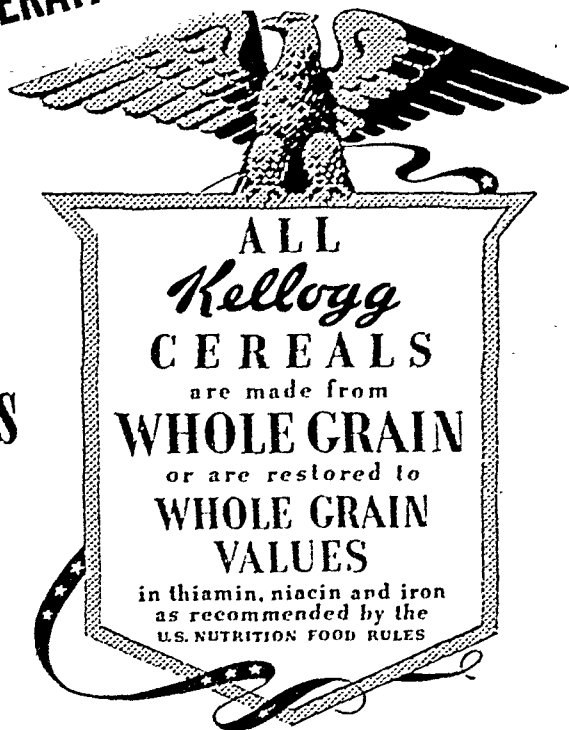
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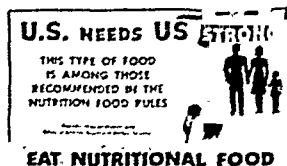
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# American Journal of Public Health and THE NATION'S HEALTH

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Volume 32

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Number 1

## Adaptation of Public Health Programs to Defense Needs\*

JOSEPH W. MOUNTIN, M.D., F.A.P.H.A.

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ONE of the outstanding problems facing us in the present emergency is the evaluation of tasks in the order of their importance to national defense and security.

Like many other groups, persons engaged in public health work wish to identify their normal activities with the defense effort. On all sides one hears rather dubious clichés to the effect that the prosecution of total warfare involves total defense. It is pointed out that the health level of the nation as a whole must be raised, that the educational status of the country must be improved, that the morale of the entire population must be placed upon a firmer basis. Everything we undertake—or would like to undertake—has, it seems, a direct and important bearing on defense—whether the measure be designed to increase the vitamin content of food products, to insure the birth of healthy infants, or to lengthen the span of life.

Fundamentally, of course, this concept of total defense is sound. Nevertheless, there is danger that it may result in a dispersion of effort which is ill suited to the requirements of the moment. If the nation were embarking upon a thirty year war, and could pursue it leisurely, emphasis on a comprehensive and long-range program would certainly be justified. Today, however, war is neither planned nor fought according to the protracted methods of the past. If effort is distributed over too many diversified activities, or if plans are made primarily with an eye to the distant future, the blitzkrieg is likely to overcome our country before we are well into the planning stage.

With so much to be done, so little time in which to do it, and such limited facilities for doing it, this is an occasion when things of immediate importance must come first. Health officers and others in the field upon whom the administrative responsibility falls will have to concentrate on those activities which are most important and most urgent. Stated in the simplest terms, this means

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\* Read before the Health Officers Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 16, 1941.



that they must give first thought to safeguarding the health of our soldiers, sailors, and workers in defense industries—those who are being trained to do the shooting and those who are providing the guns and materials with which to shoot.

The Army and Navy have their own medical and sanitary corps. Within the limits of their authority, these organizations are doing fine work in protecting the health of soldiers and sailors, but their efforts cannot be successful unless they have the full coöperation of civilian health agencies. The health and well-being of the men in the barracks depend to a great extent on conditions outside of the cantonments, conditions over which Army and Navy medical and sanitary officers have no control. Men in training spend considerable time "off post." While on maneuvers or leave of absence they travel long distances. Basic insanitary conditions or laxity regarding matters of social protection in communities frequented by military personnel may result in individual ill health or the introduction of disease into a military establishment. Even more especially, civilian health authorities have a direct responsibility for the health of the greatly increased force of industrial workers now engaged in producing essential goods. If the Army and Navy are to be supplied with the materials they need, not only must defense workers be kept on the job but also they must be kept there at a maximum level of health and efficiency.

Now, what are the chief problems encountered in adapting the health services of the country to defense needs? As far as communicable diseases are concerned, the only ones which have given any real trouble to date are the venereal infections. The coming winter, however, may provide a test of whether or not we will continue to be so fortunate in this respect. Last winter

conditions were rather favorable. Relatively few soldiers had actually arrived in the camps, and many of them were partially seasoned troops. True, large numbers of construction workers were employed in defense areas, but they were more or less inured to hard work and exposure. This winter the camps will be filled to capacity. Many of the men will be new recruits who have not developed immunity to various infections which they may encounter in their new locations. It will therefore be necessary for both civilian and military health authorities to be on the alert for every sign of communicable disease.

Except for the venereal diseases, which I shall mention again later on, the greatest tasks encountered so far have been those dealing with elementary sanitation—the provision of fundamental sanitary services such as safeguarding water and food supplies, removing garbage, and disposing of sewage. Only those who have seen the insanitary conditions of boom towns are able to appreciate problems now confronting health authorities in many localities. Almost overnight, communities have sprung up in which no facilities for sanitation have yet been provided. In other places, the sudden increase in population has rendered existing facilities altogether inadequate. To indicate the magnitude of this problem, I may cite summary findings of the reconnaissance surveys undertaken by the U. S. Public Health Service. In 184 major defense areas surveyed, it was estimated that more than 105 million dollars would be needed to provide essential water, sewerage, and garbage disposal facilities for the contained communities. This is only a portion of total needs, since many secondary defense areas are not included in the estimate. Furthermore, other major areas are yet to be established for which no prediction of sanitation requirements can be made.

In many instances it is utterly impossible for the communities in question to provide the facilities through their own resources. Take the example of a small southern town adjacent to a newly constructed military camp with a strength of about 14,000 men. Before the camp was built the town's population was 625; today it is over 5,000. Whereas there were formerly two restaurants which did little business, ten are now operating to capacity, to say nothing of about forty "juke joints" where drinks and light lunches are served. The town had no local health organization whatever. There was no sewerage system. Public toilet facilities were limited to two single toilets in the basement of the courthouse, and these were restricted to use by white persons. Several artesian wells provided drinking water, but because of a marked sulfurous taste the townspeople preferred the water from a shallow well in the courthouse square, which was found to be heavily contaminated from a nearby cesspool. The artesian wells flowed continuously from unfauceted pipes and drained into the surrounding lowland where malaria-bearing mosquitoes bred in profusion.

To meet the critical situation in which this town suddenly found itself, at least \$80,000 was needed for a sewerage system, \$25,000 for water supply and distribution, \$20,000 for a health center, and about \$15,000 a year for the maintenance of a local health department—a total of \$140,000. But the aggregate income from taxes during 1939 was only \$720! The income during 1940 was said to be more—about \$1,200. Nobody was quite certain of the amount because there had not been enough money to hire an auditor.

Nevertheless, prompt action was imperative. With the emergency health and sanitation funds provided by Congress, the Public Health Service made available through the state health de-

partment a commissioned medical officer to organize an emergency local health department. Assisting him were an engineer, a nurse, and a clerical worker provided by the state and county. They are still there, working under the direction of the state health department. All four of them and their equipment are crowded into the eight by twelve foot jury room, a small section of which has been curtained off for clinical purposes. When a jury convenes, the health department simply moves out. By scheduling field work on these occasions, this resourceful health officer makes a partial adjustment to a rather unsatisfactory office arrangement.

In the short time of its operation this rudimentary health unit has done remarkable work. With the aid of county funds and WPA labor, a modern comfort station has been erected in the center of town. Malaria control measures have been instituted and supervised. Dairy and restaurant inspection has been rigidly maintained, and today elementary sanitation is provided even in the "juke joints." The town officials were induced to apply a sledge hammer to the housing of the contaminated courthouse well, and to seal the well with concrete. A venereal disease clinic has been established, and close coöperation is maintained between military and civil authorities in prostitution repression, case reporting, and contact tracing. These activities represent only a beginning. With proposed improvements such as an adequate water supply, a sewerage system, and a health center—now possible through funds provided by the Community Facilities Act recently passed by the Congress—this town will be assured fundamental measures for protection of health.

Problems similar to those encountered in this small southern community exist in many other defense areas throughout the country, and are being met in a similar way. While the initial capital

grants for the additional facilities and services will have to be provided in most instances by the federal government, many of the communities which will benefit by defense activities should eventually be able to assume a major share of the financial burden. The increase in population, business, and property values will provide a basis for tax income which can be utilized to pay for and operate the improvements.

But there are several obstacles beside lack of funds. The health organization of this country is complex, uneven, and diversified. Administrative jurisdictions overlap and sometimes conflict. In many localities health laws and ordinances are lacking; in others they are inadequate. In some places enforcement of existing laws is not seriously attempted. Many defense establishments are of necessity situated in rural or semi-rural areas where zoning regulations to determine the uses of property have not even been thought of. In such areas a person is at liberty to set up almost any kind of establishment he wishes, wherever he wishes, and operate it as he pleases. As a result, the usual practice of health authorities is to wait until an intolerable situation has developed and then hail the operator into court for maintaining a nuisance. Many situations of this type can be prevented if health officers will exercise foresight and see that needed restrictions are enacted and put into effect. Where proper health regulations are nonexistent or where they are not enforced, correction can often be achieved by having the military authorities declare the offending establishments "out of bounds." This has had a prompt and salutary effect in most instances, but it is a "last resort" measure and is equivalent to an admission that civil government has failed. Another stumbling block, legal in character, arises from low debt ceilings and lack of authority to issue bonds for public improvements, especially

bonds to be retired by income from use of the proposed utilities. Further difficulties result from the absence of legislation which would enable public bodies to operate facilities even though they may be constructed as outright grants. There are, for example, areas in which no public agency has authority to construct or operate a hospital. In some states, cities and counties cannot maintain a hospital jointly. An aggregation of dwellings gives rise to need for sanitary facilities, but unless this population group forms a body politic, it is not in a position to construct or operate such facilities. State and local health departments should have been aware of these legal deficiencies, but apparently they were not; they even neglected to act after being warned by federal agencies, and when the emergency arrived, many were wholly unprepared.

The greatest problem of all, however, is the shortage of properly qualified and trained personnel. If all other difficulties could be resolved at once through the acquisition of facilities and organizational framework necessary for the task—health agencies would still lack trained man power. One need not have the gift of prophecy to foretell that the personnel problem of health departments will become more acute as the defense effort of the nation is increased.

Since 1936 an extensive program of postgraduate training for public health personnel has been carried on with funds made available to the states by the Federal Social Security Act and the Venereal Disease Control Act. In these five years both the quantity and quality of professional health personnel have increased very markedly. Nevertheless, the supply is still inadequate. Last April, with emergency funds voted by Congress, the Public Health Service began to recruit and prepare public health workers for special defense activities. After a short period of orientation in which the re-

sources of the National Institute of Health are used, these workers—physicians, engineers, nurses, and laboratory personnel—are assigned by the Service to communities where they are most urgently needed. They are paid with federal funds, but are responsible directly to the state or local health departments to which they are assigned. In so far as possible an effort has been made to enlist persons who are not already employed by state or local health agencies, but sometimes it becomes necessary to depart from this practice because federal civil service regulations require that persons be accepted from established registers. Our aim has been to provide highly mobile units which can be utilized to speed the defense program in critical locations. To date, 426 professional workers, including 98 members of the regular and reserve corps of the Public Health Service, have been detailed to general health and sanitation work, industrial hygiene, and venereal disease control activities. Comprising the total are 94 medical officers, 171 engineers, 112 nurses, and 49 laboratorians and specialists. To these will be added others. As soon as one group of recruits has completed the orientation course, another group is ready for induction. This process will be continued until the more pressing needs have been satisfied.

Of course, this emergency orientation program of the Public Health Service hardly does more than scratch the surface of the total personnel problem. It is hoped, however, that existing methods may be incorporated into a more comprehensive system that will meet health demands not only within special defense areas but also throughout the nation.

In the main, essential health services for the general civil population throughout this country will have to be provided by the states and communities themselves. State training programs must be continued, but this alone will not be

enough. There are two other ways in which the disparity between personnel needed and available can be at least partially resolved. First, health departments must enlarge the scope of their training activities. Second, when necessary they must dilute their staffs with personnel whose qualifications and training are of a somewhat lower grade than would be acceptable under normal circumstances. It is not meant that persons who are wholly untrained should be employed, but rather that some partially trained workers will have to be utilized for the duration of the emergency. It may be necessary to apply similar dilution throughout the entire organizational structure of our health units. This statement does not imply that merit systems of personnel administration should be disregarded. It is possible to adapt merit systems to current needs by setting up interim classifications in which persons with lesser qualifications may be hired on a temporary basis to meet urgent needs. Thus, if three engineers are needed in a community where only one is available who meets the qualifications for the title "sanitary engineer," a lower classification such as "acting sanitary engineer" or "sanitary engineering aid" might be set up to permit temporary employment of the other two.

Consideration must also be given to enlargement of function. Health departments have traditionally regarded themselves as educational and law-enforcement agencies. They have been content to find out what ought to be done and to tell others how to do it. Operation of facilities has been shunned even when the facilities bore a direct relationship to the health of the community. This attitude is not suited to the present emergency. If some essential tasks are to be accomplished at all, health departments will have to break a few precedents and do them—with their own personnel. They may be re-

quired to operate new water and sewerage plants as well as hospitals and clinics. They may also find it necessary to assign engineers and others from their staffs to operate facilities from which regular personnel are called for military duty.

An old problem which has placed a tremendous burden upon health departments is control of the venereal diseases. This has always been a source of trouble during periods of military mobilization, and the present is no exception. Since the last war, our resources for combating these diseases have been materially increased by the development of new therapeutic methods, but improved therapy is not the complete answer; it must be accompanied by vigorous repression of prostitution and effective contact tracing. Furthermore, repression and contact tracing on a local basis are not sufficient. Prostitutes who are compelled to leave one town or county quickly invade the neighboring ones. Even state-wide action is not enough by itself. Present-day transportation facilities which enable both prostitutes and their patrons to move readily from place to place add greatly to the difficulties of contact tracing. Health units today should be staffed and equipped so that they can coöperate in venereal disease control work with military and civil health authorities not only in nearby jurisdictions but also in distant places. Again this requires additional personnel. So does coöperation with welfare authorities, which is essential if the itinerant and local girls who engage in casual prostitution are to be reclaimed before they become confirmed in the profession. The chances for rehabilitation of these girls would be greatly increased by the provision of suitable places of detention where they could be treated and given training for useful pursuits. Penal institutions not only are inadequate but are altogether unsuited to this purpose. Here, too, it is hoped that by means of

funds made available through the Community Facilities Act some such accommodations can be provided, preferably in conjunction with appropriate state institutions.

The defense program has also made it necessary to give increased attention to industrial hygiene. The effective use of modern machines calls for efficient workmen. It is estimated that even in normal times the nation loses about 350,000,000 man-days a year through all types of industrial disability. A substantial proportion of this disability is caused by circumstances arising out of the nature of the job or the conditions of the working environment. Acceleration of production for defense has intensified existing industrial hazards and created some new ones. The fatigue factor which is responsible for so many costly accidents has assumed greater importance than ever before. Sanitary, safety, and medical care facilities have had to be provided in hundreds of new and expanded defense establishments. It has been necessary to investigate the potential hazards involved in the use of new materials and processes, and to develop safeguards when needed.

A special effort has been made to establish and strengthen industrial hygiene divisions in state and local health departments. Included among the emergency health and sanitation personnel previously enumerated are 26 trained persons loaned by the Public Health Service to aid these divisions in their work. Also mobile units of specially qualified physicians, engineers, and chemists have been provided to conduct surveys and make recommendations in places where states did not have the necessary resources. The Public Health Service has also surveyed arsenals and other industrial establishments operated by the War Department and is now conducting investigations in government-owned but privately-operated defense plants.

Another important task with vital bearing on our national security is physical rehabilitation of young people throughout the country—the group on whom the nation must rely for both its military and industrial man power. Some health authorities frequently extol the United States as the healthiest nation in the world. If anyone is impressed by complacent generalities of this sort, the figures showing the rejections for selective service ought to disabuse him. We may be a healthy nation in respect to communicable disease rates, but according to any absolute physical standard there is certainly no reason to be proud. Since the draft examination data were made public, there has been considerable discussion of rehabilitation, but little has actually been accomplished. These findings represent a general problem which public health authorities must face, but so far as I am aware no comprehensive state program has even reached the planning stage.

Let me add here that at the outset of the national emergency, the Public Health Service assigned one of its medical officers to the headquarters of each Army corps. This assignment has greatly facilitated operations of the health aspects of the entire defense program. Furthermore, it has served to bring the military authorities, particularly the medical corps, into close touch with state and local health workers and thus has given a measurable impetus to public health activities in general. Appropriate credit is due the state health authorities and the local communities for their efforts to cope with the emergency. This effort is expressed by the diversion of approximately \$1,689,000 federal and state grant-in-aid funds to defense areas and by the appropriation of \$639,000 of new money by the localities concerned. This, of course, does not take into account budgets for the support of preëxisting health organizations.

#### CONCLUSION

In conclusion, it should be said that as the national emergency grows more acute we of the public health organization may not be able to do everything that is considered desirable for all groups of the population. In some instances customary activities will have to be curtailed in order to devote time and effort to immediate defense tasks. It may be necessary to go farther than this; health departments may have to share their personnel with other agencies even more generously than they have to date. If health officers whose departments are already under-staffed feel that this is asking too much, I would ask them to consider the predicament of an Army post surgeon to whom I spoke several months ago. In the area around his camp, all the chaos associated with construction prevailed. An epidemic of influenza was threatening, and some 20,000 fresh troops were scheduled to arrive. Yet there was not a single physician, engineer, or nurse with public health training under the command of this medical officer. As a matter of fact, all there was in the way of public health organization was a single veterinarian who in civil life specialized in the care of pet animals. The post surgeon was not very happy about the prospect. This, of course, represents an extreme situation during the early organization of the defense program. Needs, less dramatic but perhaps equally important, exist today, and they are certain to increase in number as the emergency requirements increase. When demands for trained personnel arise in the military establishments, they must be filled at once, even though doing so means taking people away from other jobs. As a group, we must be prepared to abide by certain priorities in health work just as we do in regard to iron, steel, rubber, and other vital defense needs.

Eventually our efforts, if properly

directed in this emergency, will redound to our permanent benefit as well as to that of the nation.

When the crisis is over, some of the additional facilities established for the emergency will probably be dismantled, but many of them will remain in use. The tradition of essential service will endure under all circumstances. As a

result, the health organization of the country as a whole will be on a higher level than it was before. We will then be in a better position to develop some of those optional services having to do with improving the health status of the general population. Until then, first things will have to be placed first on the agenda.

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WANTED: The following issues of the *American Journal of Public Health*—April, 1911; February, 1937; January, 1938; February, 1939; July, 1941; and August, 1941. The American Public Health Association will be glad to pay postage for the *Journals*.

# Mobilization of Industrial Hygiene for National Defense\*

W. J. McCONNELL, M.D., F.A.P.H.A.

*Metropolitan Life Insurance Company, New York, N. Y.*

SCARCELY more than a quarter of a century has passed since industrial hygiene has attained recognition in America as a special field of endeavor for maintaining and promoting the health of industrial workers. Prior to this period, emphasis was placed on the surgical treatment of injuries and the alleviation of illness rather than on preventive measures. Frequently the emergency care of injuries was the only motive for providing medical services.

Many factors have contributed to our present broader concept of medicine's serviceableness to industry. Not least among these were the courageous efforts on the part of a small group of men with a keen sense of responsibility to their fellow men who, despite little general interest on the part of professional groups in the subject, banded themselves together through the Industrial Hygiene Section of the American Public Health Association, the American Association of Industrial Physicians and Surgeons, and other organizations for the purpose of fostering the study and discussion of the problems peculiar to the field of industrial hygiene.

By an Act of Congress passed in 1912, the U. S. Public Health Service was authorized to "extend its research functions to the study and investigation

of all diseases of mankind and conditions influencing the propagation and spread thereof." As a result of the passage of this Act, the Service established in the Marine Hospital at Pittsburgh, Pa., during the year 1914, the Office of Field Investigations into Occupational Diseases. The name was changed in the following year to the Office of Field Investigations in Industrial Sanitation and the office was transferred to Washington in 1918. The creation of this office in the U. S. Public Health Service marked an important forward step in the advancement of industrial hygiene. The improvement of industrial health became in this way a national concern.

During the year 1914 the Industrial Hygiene Section, the fifth of the present ten sections of the American Public Health Association, was organized. The Conference Board of Physicians in Industry also was established in 1914. This Board acted in an advisory capacity to the National Industrial Conference Board. The following year saw the organization of the American Association of Industrial Physicians and Surgeons. In 1920 the American Medical Association recognized the existence of this special field by merging industrial medicine with preventive medicine and public health in the Scientific Assembly. It was not until 1937, however, that the governing bodies of the American Medical Associa-

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\* Chairman's Address delivered before the Industrial Hygiene Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 14, 1941.



tion organized the Council on Industrial Health as a standing committee of the Board of Trustees. Since its organization the Council has made important contributions to industrial health. It has been active in stimulating the formation of committees on industrial hygiene in state and county medical organizations, and has established working relations with all agencies interested in industrial health.

During the 1st World War impetus was given to industrial hygiene through national agencies. The creation by act of Congress in 1916 of the Council of National Defense, which provided for the appointment by the President of an advisory commission, resulted in the formation of a number of committees and subcommittees not unlike those of today. One of these subcommittees, known as the National Committee on Welfare Work, issued a series of reports aimed at aiding employers in the vital industries to maintain and conserve the health and efficiency of their workers through improved working and living conditions and improved training methods. During this period personnel of the U. S. Public Health Service was detailed to the Working Conditions Service of the Department of Labor and functioned under the name of the Office of Industrial Hygiene and Medicine. The personnel of this office supervised the sanitation and medical service in as many of the industrial establishments owned or operated by the federal government as was possible with the limited personnel assigned to carry out these functions. This cooperative work with the Department of Labor was discontinued in 1919 because of lack of funds, and the organization reverted to the U. S. Public Health Service. The name was again changed to the Office of Industrial Hygiene and Sanitation, which is now the Division of Industrial Hygiene and Sanitation, located at Bethesda, Md. The excellent record in scientific

investigations in a number of occupations and dangerous processes made by the Public Health Service through this division is well known.

Other federal agencies, particularly the U. S. Bureau of Mines and the U. S. Department of Labor, have been active in this field and have conducted numerous investigations and laboratory research which have thrown light on some of the pressing problems affecting the health of workers in a variety of industries and mines.

During the intervening years many national and local associations, either wholly or partly devoted to the advancement of industrial hygiene, have contributed to our knowledge in this field. A few of the universities began to offer courses in subjects pertaining to industrial hygiene, and some of the insurance companies engaged personnel to assist their insured industrial organizations with a solution of their health problems. While time will not permit even a brief review of the various activities of these agencies, their contributions have been many and have served to focus attention on prevention as a cardinal principle for reducing the incidence of disability, whether through accident or disease.

The organization of industrial hygiene departments in many of the states and in some municipalities has made available to industry a valuable service which will be increasingly used as their work is demonstrated. As recent as ten years ago only a comparatively few states offered this service to industry, while today 34 states and 4 cities, aided where necessary by federal funds and by personnel from the Division of Industrial Hygiene of the National Institute of Health, have well organized departments.

These and other factors, such as the passage of state compensation acts for occupational injuries, the accident prevention movement, the acceptance on the part of enlightened management of

the principles on which health services to industry are based, and, more recently, the enactment of the occupational disease compensation laws in many states, have all contributed to the expansion of health facilities in industry and have pointed to the necessity of conducting research in fields which offer greater promise in reduction of disease and suffering.

Today industrial hygiene is recognized generally as a part of a good public health program, and may be defined as that branch of the medical, engineering, chemical, and nursing sciences which is concerned with the study of the effects of environmental conditions in industry upon the health of industrial workers from the point of view of the incidence, the causes, and the nature of the effects, and with the means of eliminating or minimizing the causes, and thus removing or modifying the effects. Industrial hygiene also is concerned with the general effects of industrial life on the incidence of all diseases, and aims at rendering the industrial worker safe, healthy, and efficient.

This brief summary of the development and scope of industrial hygiene activities is recounted for the purpose of indicating the progress of the industrial health movement and of pointing out the chief industrial hygiene resources of the country.

In the mighty defense effort in which we are now engaged, the mobilization of these resources, as well as careful planning of new activities and the training of additional personnel must be given a conspicuous place in the national defense program. The reason lies in the fact that wars which were formerly fought between armed forces on a restricted battlefield have given way to total war and total defense, where industrial capacity is more important than arms, and where adequate man power in vital industries is a major military factor. The very urgency of our de-

fense requirements has emphasized the need for a well planned program of industrial hygiene for the protection and conservation of health among defense workers.

The importance attached to an effective health maintenance program was stressed by Dr. Daniel L. Lynch in his presidential address before the Association of Industrial Physicians and Surgeons last May when he said:

The industrial workers' physical fitness, their freedom from preventable disease and injury, their morale or mental stamina, their ability to achieve for national defense, will determine almost entirely the effectiveness of all other efforts. Desirable in the easy days of peace when no cloud of war blackened the horizon, it is imperative now that the workers in industry, especially, "must be physically tough, mentally sound, morally strong." If they are not, we can leave our planes unbuilt, our battleships in blueprint. We shall not need them.

It remains to be seen how well those responsible for planning and directing an industrial health program have met this challenge, and similarly how we in the industrial hygiene field have responded to the call for service with all the increased opportunities and responsibilities that are ours.

The mobilization of the medical and health resources of the nation and the responsibility for coordinating all health and medical programs affecting the national defense found expression first through the creation on September 19, 1940, of a Health and Medical Committee by the reestablished Council of National Defense. Later, the Council, by Executive order of the President, transferred the Health and Medical Committee to the Federal Security Agency for the purpose of advising and assisting the Administrator in carrying out his duties as Coordinator of Health, Medical, Welfare, and Related Activities.

One of the first acts of the Health and Medical Committee was the appointment of six subcommittees, each

representing broad segments of medical interests. Of particular interest to this group is the Subcommittee on Industrial Health and Medicine under the able chairmanship of Dr. C. D. Selby. This subcommittee is charged with the duty of making specific recommendations pertaining to activities in this particular field to the Health and Medical Committee.

The Subcommittee on Industrial Health and Medicine has been transferred within the past month to the Office of Health Defense and Welfare Services in the Office for Emergency Management, under the directorship of Paul V. McNutt, following the creation of this new organization on September 3, 1941, by President Roosevelt. The members of this subcommittee also have been appointed as a Committee on Industrial Medicine of the Office of Scientific Research and Development of the National Research Council.

An early recommendation of the subcommittee was that the Division of Industrial Hygiene of the National Institute of Health, because of its years of research and experience in this field and its close relationship with national, state, and volunteer agencies either directly concerned or interested in the industrial health problems of national defense, assume the leadership in a program for achieving the defense objectives. Other specific recommendations made by the subcommittee called for an expansion in personnel facilities and funds of state bureaus of industrial hygiene and the Division of Industrial Hygiene of the National Institute of Health; the training of large numbers of personnel in industrial medicine, hygiene, and nursing; the safeguarding of the health of workers employed in the industrial organizations of the War and Navy Departments; and further researches into new industrial processes which might be injurious to the health of exposed workers.

These recommendations were approved and at the present time are being carried out. In order to facilitate the work, Surgeon General Parran has created a new section in the Division of Industrial Hygiene of the National Institute of Health, with Sanitary Engineer J. J. Bloomfield in charge. This section is concerned with all national defense activities and states' relations in industrial hygiene.

The activities of this section as well as those of the section on industrial hygiene research, in charge of Dr. Paul A. Neal, are being carried out under the general direction of Medical Director J. G. Townsend, Chief of the Division of Industrial Hygiene.

The work of the division has been supplemented with fifteen teams or units, each unit consisting of a specially trained physician, an engineer, and a chemist, with additional personnel as required, serving as mobile field units available to go anywhere in the country to survey health hazards in war industries and to provide consultation service, in coöperation with the state and local health departments, to any defense industry requiring such assistance.

The accomplishments already attained by the Division of Industrial Hygiene of the National Institute of Health in the field of industrial hygiene and in the toxicological research on defense materials, and by studies on the effects of physical and other environmental factors, particularly those of an emergency nature, as well as the many accomplishments of state industrial hygiene units which are all engaged in furnishing services to defense industries, have been described on several occasions elsewhere and need not be enumerated here.

Coöperative programs with other divisions of the Public Health Service and with various other governmental bureaus, as well as with independent agencies, will bring to the industrial

worker the benefits of all the adult health services.

The American Standards Association, through its Sectional Committee on Allowable Concentrations of Toxic Dusts and Gases, is coöperating with the Division of Industrial Hygiene of the National Institute of Health in the preparation of technical standards for the prevention of industrial diseases. Codes have already been adopted and printed for benzol, hydrogen sulfide, carbon disulfide, and carbon monoxide. Work is actively under way on codes for many additional substances that are dangerous to health. The association also is engaged in the preparation of a wide variety of standards for use in the national defense program. The Standards Council has devised a method for quick action in developing emergency standards for defense purposes which will make it possible to turn out standards needed to speed along defense production as rapidly as is consistent with a good technical job.

The American Medical Association, through its Committee on Medical Preparedness, appointed in June, 1940, has made available every facility that the association can offer for the health and safety of the American people. A most important activity undertaken by the committee consisted of assembling a complete roster of the medical personnel of the United States and its possessions for the purpose of determining the number of physicians available for service in various capacities. To every physician who indicated active participation in industrial medical work, the committee sent an additional inquiry designed to acquaint the committee with the special qualifications which individual physicians possess and also certain details about industrial medical facilities which they command. It is of interest to note that this is the first time in the history of our country that an effort has been made to obtain this

exceptionally useful information. In addition to the services conducted by the Association's committee on Medical Preparedness, the Council on Industrial Health of the Association has been active in carrying out its program of industrial health and is making a real contribution in this field. A joint committee of the Council on Industrial Health and the Subcommittee on Industrial Health and Medicine was formed last January to make recommendations to the Health and Medical Committee of the Federal Security Agency covering industrial hygiene needs of national defense.

The National Research Council, which was established in 1916 as the operating agency of the National Academy of Sciences, and was perpetuated at the end of the war in 1918 through an Executive order issued by President Wilson, is an important quasi governmental organization now permanently established to give advice to the government "on any subject of science or art."

The Council through its Division of Medical Sciences established during the summer of 1940 a number of advisory committees covering the fields of medicine, surgery, and information, as well as a number of technical subcommittees. The work of a number of these committees has a direct bearing on industrial medicine—the research project on the prevention of wound infection and the treatment of burns conducted by the Subcommittee on Surgical Infections; the projects dealing with all aspects of shock under investigation by the Subcommittee on Shock; the study of problems on aviation medicine conducted by the Committee on Aviation Medicine; the study of problems of neuropsychiatry to be carried on by a committee on neuropsychiatry now in the process of organization; and the investigations on fatigue, pressure studies, clothing for high and low temperatures, gas poisoning, and other subjects being conducted by appropriate committees and various

laboratories under the Subcommittee on Clinical Investigation serving as a clearing house for information are of particular interest to industrial medical groups. The appointment of the chairman of the Committee on Medical Research and Development of the National Research Council, as a member of the Health and Medical Committee has facilitated the correlation of these various committees with the general coördinating body. In a number of the projects carried on by the National Research Council, the facilities of the American Medical Association, the American College of Physicians, and of the American College of Surgeons are being used to advantage.

Of the associations representing the industrial hygiene engineering field which have been most active in the National Defense Program, the American Association of Industrial Hygienists, which meets annually with the American Association of Industrial Physicians and Surgeons, and the Industrial Hygiene Section of the American Public Health Association are representative. Many of the universities through their industrial engineering departments, and several independent agencies too numerous to comment on in the time at my disposal, are actively engaged in this field and are additional sources from which the nation can draw for assistance and

advice. Included in the list of these independent agencies are those industrial organizations which, either through their own research laboratories or their financial support of other agencies, are carrying on a variety of investigations relevant to employee health.

The Industrial Hygiene Foundation of America, formerly known as the Air Hygiene Foundation, is one of the agencies supported by industry which is directing its efforts on problems of immediate practical importance in the national emergency. This organization also is providing funds for research projects assigned to other research laboratories.

The mobilization and the establishment of effective working relationships between these many independent organizations and governmental agencies are functions of the Subcommittee on Industrial Health and Medicine. The intelligent and aggressive manner with which the Subcommittee on Industrial Health and Medicine is pursuing its program may be expected to bring full employment of our industrial hygiene resources, and it is hoped that when the threat of war has passed and peace again comes to the world the objectives reached will become an integral part of a permanent procedure which can be applied to industry generally in the years that lie ahead.

# Urgent Problems in Nutrition for National Betterment\*

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THE problems in nutrition which are urgent today are not especially those of research in physiology and biochemistry—problems in these fields, although of the greatest fundamental importance, cannot be regarded as urgent in the face of conditions in the world today. Fortunately, we have enough information in these fields to be able to give with a fair degree of accuracy recommendations as to the daily allowances of the various dietary essentials for normal individuals. In this connection I especially want to call your attention to the recommendations recently proposed by the Committee on Food and Nutrition of the National Research Council (Table 1). These recommendations are the best obtainable today and should be used by everyone interested in calculating diets. Therefore, although there are many important problems still to be solved in determining the human requirements for various dietary essentials, we do have enough information for practical use in developing an adequate nutrition program.

There are many problems in the physiology and biochemistry of nutrition which are highly important. We need the answers to such questions

as the rôle of deficiencies in resistance to infectious disease—What is the relation between vitamins and hormones? What are the specific enzyme systems in which the various vitamins participate? What metabolites are involved? Do we know all of the vitamins? Many other similar problems of equal importance could be listed, but the problems that I regard as really urgent lie in the field of *application* of the fundamental knowledge we now possess.

Now as never before we are awakening to the fundamental importance of adequate nutrition in maintaining health. All health officials must realize that today no health program can be complete unless it includes a consideration of nutrition, and one of the most urgent problems in nutrition is how to get every health department in this country to include nutrition as an important part of its activities. A few years ago we complacently thought that there was little of the deficiency diseases in the United States because our death reports revealed few deaths from these diseases. One of our big unanswered questions today is how much deficiency disease exists in this country. We still are unable to say with certainty, because deficiency diseases usually are not reported, the death rate is very low, and the diagnosis is often uncertain.

Another of our important problems

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\* Read before the Food and Nutrition Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 15, 1941.

TABLE 1  
RECOMMENDED DAILY ALLOWANCES FOR SPECIFIC NUTRIENTS\*  
*Committee on Foods and Nutrition, National Research Council*

	Calories	Protein grams	Calcium grams	Iron mg.	Vitamin A*** I.U.	Vitamin (B <sub>1</sub> ) mg.**	Riboflavin mg.	Nicotinic Acid mg.	Ascorbic Acid mg.**	Vitamin D I.U.
<b>Man (70 Kg.)</b>										
Moderately active .....	3000	70	0.8	12	5000	1.8	2.7	18	75	***
Very active .....	4500	..	...	..	....	2.3	3.3	23	..	..
Sedentary .....	2500	..	...	..	....	1.5	2.2	15	..	..
<b>Woman (56 Kg.)</b>										
Moderately active .....	2500	60	0.8	12	5000	1.5	2.2	15	70	***
Very active .....	3000	..	...	..	....	1.8	2.7	18	..	..
Sedentary .....	2100	..	...	..	....	1.2	1.8	12	..	..
Pregnancy (latter half) .....	2500	85	1.5	15	6000	1.8	2.5	18	100	400-800
Lactation .....	3000	100	2.0	15	8000	2.3	3.0	23	150	400-800
<b>Children up to 12 years:</b>										
Under 1 year# .....	100/Kg.	3-4/Kg.	1.0	6	1500	0.4	0.6	4	30	400-800
1-3 years## .....	1200	40	1.0	7	2000	0.6	0.9	6	35	***
4-6 years .....	1600	50	1.0	8	2500	0.8	1.2	8	50	..
7-9 years .....	2000	60	1.0	10	3500	1.0	1.5	10	60	..
10-12 years .....	2500	70	1.0	12	4500	1.2	1.8	12	75	..
<b>Children over 12 years:</b>										
Girls, 13-15 years .....	2800	80	1.3	15	5000	1.4	2.0	14	80	***
16-20 years .....	2400	75	1.0	15	5000	1.2	1.8	12	80	..
Boys, 13-15 years .....	3200	85	1.4	15	5000	1.6	2.4	16	90	***
16-20 years .....	3800	100	1.4	15	6000	2.0	3.0	20	100	..

\* Tentative goal toward which to aim in planning practical dietaries; can be met by a good diet of natural foods. Such a diet will also provide other minerals and vitamins, the requirements for which are less well known.

\*\* 1 mg. thiamin equals 333 I.U.; 1 mg. ascorbic acid equals 20 I.U.

\*\*\* Requirements may be less if provided as vitamin A; greater if provided chiefly as the pro-vitamin carotene.

# Needs of infants increase from month to month. The amounts given are for approximately 6-8 months. The amounts of protein and calcium needed are less if derived from breast milk.

\*\* Allowances are based on needs for the middle year in each group, (as 2, 5, 8, etc.) and for moderate activity.

\*\*\* Vitamin D is undoubtedly necessary for older children and adults. When not available from sunshine, it should be provided probably up to the minimum amounts recommended for infants.

is how can we diagnose early deficiency disease. Although we do not know how many cases of the deficiency diseases we have, we do know from the number of cases seen by such clinicians as Wilder, Sydenstricker, Jolliffe, Spies, and others that these cases are very common. Fortunately, we have in addition the extensive dietary surveys of Stiebeling and her associates which show that a large proportion of our population, at least one-third or more, get diets which do not come up to the accepted standards of adequacy in one or more of the dietary essentials. Furthermore, as more and more clinical studies are being conducted, we are learning that deficient diets—short of producing the symptoms of a full blown deficiency disease—may be responsible for such vague symptoms as mental depression, indigestion, easy fatigue, loss of weight, retarded learning ability, and interference with vision. We need more information in order to clarify fully the importance of such symptoms. However, with the information already at hand we can no longer ignore in our health programs conditions which may be affecting such a large proportion of our population. A few years ago Surgeon General Parran said, "Food will build a new America," and food *can* build a new America if we will let it. With the development of nutritional science so rapidly unfolding year by year, we can be absolutely certain that intelligent and widespread use of that knowledge cannot fail to build a new America.

#### NUTRITION IN THE ARMED FORCES

In a world at war or preparing for war, the problems of greatest urgency are those affecting the armed forces, and first of all come those problems concerned with the actual feeding of the men under arms. The health officer is not directly concerned with those problems. They are recognized and are

receiving adequate consideration by the military forces themselves. I believe that our military men will be as well fed as present-day nutritional science can feed them.

The problem of next importance is that of the physical condition of prospective candidates for military service. You have, no doubt, read the distressing accounts of the large number of young men being rejected for military service. General Hershey stated at the National Nutrition Conference in May that out of a million men examined by Selective Service and about 560,000 examined by the Army, a total of 380,000 were found unfit for general military service, according to present standards. This is approximately 24 per cent. He also stated that it had been estimated that perhaps one-third of the rejections were due either directly or indirectly to nutritional deficiencies. These shocking findings are a reflection of our failure to give adequate attention to nutrition in our health programs.

The *Chicago Times* recently (August 12, 1941) published an analysis of the number of draft rejections in Chicago by wards. This analysis showed that the percentage of rejections varied from a low of 39.9 per cent in the nineteenth ward to a high of 71.1 per cent in the eleventh ward. I know that you will not be surprised when I tell you that the eleventh ward with its 71.1 per cent of rejections is considered to be one of the poorest wards in the city, while the nineteenth ward with its 39.9 per cent of rejections is a well-to-do section of the city. We must recognize that many factors have resulted in this great difference. However, when it is remembered that there is a close association between low income and deficient diets, how can there be doubt that poor nutrition played a part in producing its share of those 71.1 per cent of rejections. With such a situation existing, and there is no reason to believe that



the situation in Chicago is essentially different from that in any other large American city, the two most urgent problems are obvious. First, how many of these rejectees can we rehabilitate by proper nutrition now and what is necessary to bring this about? Second, what can we do toward preventing the development of these defects due to poor nutrition in our children?

We know now that an adequate diet is just as important in terms of human health as adequate housing, adequate sewage disposal, or adequate prevention of communicable disease. We who are in public health work are not in a position to see to it that people get or eat the right foods. We are, however, in an especially advantageous position to emphasize the value of such a program to health and to teach the great importance of these things in the maintenance of health. If we fail to do so, we will be guilty of ignoring one of the surest roads to real public health.

#### NUTRITION IN INDUSTRY AND AT HOME

The next most urgent problems in nutrition after those affecting the military forces are those affecting the workers in defense industries. These workers constitute our second line of defense and more is demanded of them than ever before. We know that the need for thiamin increases with increased strain and activity, and here we have thousands of workers under greater strain and activity than they have had for years, with no organized effort to improve their food supply. In addition many thousands of them have been moved from their homes into sections not prepared either to house or to feed them properly. Instead of improving their nutritive status, it undoubtedly has become worse in many instances. We find that industrial medical services have paid little or no attention to nutrition, although the time lost by workers from occupational diseases is inconse-

quential compared to the time lost from non-occupational diseases. We need to know how prevalent inadequate diets are among industrial workers, and we need to show plant managers that adequate nutrition means a more efficient, healthier, satisfied worker. Part of our industrial hygiene program, which now largely ignores nutrition, should include a study of the eating habits of the workers and recommend, where indicated, the establishment of plant dining rooms and the serving of an adequate meal at minimum cost. These constitute large problems which urgently need solving.

Finally, we come to problems of nutrition affecting the entire population. As health officials we must build for the future with a continuing program. Although military and defense problems are most urgent today, in time these men will again fit into the larger picture of our entire civil life, but now they must be sustained by a civil population of high morale and good health. The Secretary of Agriculture recently said "Food will win the war and write the peace." With these two goals ahead of us, the problems of better national nutrition become problems that we *must* solve. An understanding of this fact by farmers, government, science, and industry is, as a matter of fact, one of the first of these problems. We must realize that in the United States we are not faced with the problem of having to decide between "guns and butter." We must realize that if the United States is to bring its full weight to bear in ending the present conflict, we must supply for our country and for the other democracies both guns and butter. We must place food on a parity with guns because our food is as urgently needed by England as our planes and tanks. And when we look forward to the day when the shattered nations of Europe gather round a barren peace table, then we will see the truth

of the slogan that food will not only "win the war" but will also "write the peace."

#### PRODUCTION

Our great problem is to produce and to begin to produce now enough of the protective foods to meet these enormous demands. No matter how badly you need them, nothing can shorten the number of days it takes to produce a cow, a pig, or a chicken, and the time to start is now. Production is the great nutritional problem for American agriculture, and Secretary Wickard wants to make dairy products, livestock, and vegetables basic crops, as important in the nation's economy as cotton, tobacco, or wheat. He wants to build up food stocks which the rest of the world can use after the war. If we do produce these basic protective foods, there is no question but that ways and means will be found to distribute them.

#### DISTRIBUTION

This brings me to the biggest and toughest problem blocking the way to better national nutrition. This is the problem of distribution—of getting the food the people need to the people who need it most. This is another nutritional problem which is outside the province of the scientist and the health officer. Nevertheless, it is one which must be appreciated by anyone attempting to solve our national nutrition problems, and we must all throw our support to the agencies attempting to solve this problem. We already have the food stamp plan, the hot school lunch program, penny milk distribution, and various other channels of food distribution to those who cannot afford the foods they need. Other ways and means inevitably will be devised to distribute foods once the appetite and demand for them has been established. But regardless of these enormous economic problems which are so basic to the solution of the problem of malnutrition in

America, we must continue, each in his own field, to contribute to the solution of those phases of the problem which we are especially qualified to attack.

#### TEACHING WHAT TO EAT

One of the great practical problems with which you especially must be concerned is the difficulty of educating Americans to the difference between good and bad food habits. This problem has been valiantly and constantly attacked by several government agencies over a period of years. Today it is being attacked with a barrage of educational material without parallel in nutritional history, but we need your assistance also. Nutrition education should be a large and important part of every health education campaign. If your health department is not doing nutrition educational work, your health program is not complete. The problem of nutrition education is still a long way from solution. The American people still eat and cook the way they like to eat and cook, regardless of the deficiencies in their diet or the vitamins they cook away and pour down the drain. In recent years the public has obtained a large part of its nutrition education from commercial advertising, much of which has been misleading or incorrect, a condition which many health and medical men have deplored. It has become obvious since the National Nutrition Conference that the great food industries in the United States can be a powerful ally in the solution of our nutrition education problems. Up to the present, and no one can blame them, these food industries have spent millions of dollars annually to sell their products on the basis of attractiveness and taste appeal. But now, with increasing public recognition of the importance of a well balanced diet, these industries are beginning to reevaluate their products—to stress the fact that they are rich in proteins, or minerals, or vitamins, and

they are eager to have their advertising material technically correct. The question of how to coördinate and take advantage of the immense potentialities in this new attitude of the food industries is also a problem, but it is one which promises much when it is solved. The coöperation between science, government, and industry which was held up as a desirable goal at the National Nutrition Conference is daily coming closer to actuality.

One of the most valuable and successful activities has been the voluntary enrichment of white bread and flour by the baking and milling industries. This single step voluntarily taken by the bakers and millers, and publicly endorsed by the government agencies concerned, has not only made available significant quantities of thiamin, nicotinic acid, and iron in a basic and universal food item at minimum cost, but has also started a trend in food advertising and nutrition education that cannot fail to educate the American public to the values of truly "protective" foods. Furthering the distribution of enriched flour and bread in your community is not only an educational measure but also will materially help in the prevention of deficiencies in thiamin, nicotinic acid, and iron.

This problem of nutrition education then is one in which the health department should be vitally interested. I want to call your attention, however, to the necessity for coöperation in this field. There are many agencies inter-

ested in nutrition education. If your health department has neglected this field, you will probably find that other agencies have been trying to do both their job and your job too. State nutrition committees have now been organized in every state and we hope to see them become part of the state defense councils, and we hope soon to see more community nutrition committees in operation. You have a part to play in a larger program; let me urge you to contact your state nutrition committee, coöperate with your committee members, and make your program part of their plan if you have not already done so. The federal government can coördinate the program at the national level; it is up to you to bring about coördination and coöperation at the state and local levels.

In the field of public health, our duty is clear and well defined. We must accept the fact that malnutrition is one of the major causes of ill health and poor growth and development, and is one of the most important of the health officer's problems. We must realize that the problem of getting an adequate diet to the people is just as urgent a problem as keeping infection away from the people—that nutrition is truly the armour of robust health. With this conviction the public health workers in the United States can and will be where they should be—in the very forefront of the fight to vanquish malnutrition for America—which is the greatest problem of national nutrition.

# Water Demands and Sewage Production in Military Cantonments

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THE design of water and sewerage works for a military cantonment, while involving the same basic engineering problems as are found in the design of municipal works, differs from the latter in the emphasis and relative importance placed upon various design features. Thus, where permanence and long life are given great weight in the design of municipal works, these factors may be of secondary importance for a military cantonment. Economic factors influence design in both cases but the emphasis is different; with a municipal works we are concerned with a business enterprise where operating costs are of primary importance, whereas with a cantonment, which may be used for only a few years, economy in construction is likely to be of greater importance than economy in operation. Moreover, reliable water consumption data to guide the engineer in the design of municipal water and sewerage works are available for most cities and towns, but such data for military cantonments are not so readily available. This paper presents a discussion of the allowances used in the design of water and sewerage facilities at Camp Edwards in

Massachusetts together with records covering the operation of these works for the past eight months.

The wholesale construction of military cantonments under the present National Defense program began a little more than a year ago. In August, 1940, it was known that Camp Edwards, formerly a National Guard training camp situated on Cape Cod in Massachusetts, was to be leased from the state as a site for a military cantonment designed to house some 30,000 troops. In anticipation of this action the Massachusetts Department of Public Health undertook certain preliminary studies looking toward the expansion of the water supply and sewerage works to meet the needs of the proposed new cantonment.

It may be of interest to compare the water consumption allowances used by the Health Department in these preliminary studies with those used later, when the design of the new works was undertaken under the direction of the Construction Division, Office of the Quartermaster General. The Health Department based its consumption allowance on that used in the design of many of the army cantonments in 1917; namely, an average consumption of 55 g.c.d. (gallons per capita daily). While it was known that some of the World War cantonments suffered occasional

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\* Read before the New Jersey Section of the American Water Works Association and the Engineering Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 16, 1941.

water shortages, it was felt that the replacement of horses and army mules with mechanized equipment would reduce rather than increase the water requirements. It should be said that this preliminary work by the Health Department, in which the author assisted, was undertaken with practically no knowledge of the plans and details of the proposed cantonment.

Design and construction of the new camp started a few weeks later under the Construction Division, O.Q.M.G. One of the first considerations in the design of the water supply and sewerage works was an early decision on the unit allowance for water consumption. Information on this point was sought from Washington and instructions were received to base the design of water works on an average consumption of 100 g.c.d. and a maximum domestic rate of at least twice this amount. Thus, in spite of the replacement of horses and mules with mechanized equipment, water consumption allowances had increased nearly 100 per cent over those used in 1917. No doubt a part of this increase can be attributed to the experience of World War days when camp populations increased considerably above the design figures. This, together with the fact that plumbing facilities in the new cantonments were to be more in keeping with present-day standards of living, would appear to explain the increased allowance. It will be shown from the operation records at Camp Edwards that the new consumption values adopted are not excessive.

Both the water supply works and the sewage disposal plant at Camp Edwards were designed on the basis of an average water consumption of 100 g.c.d. and a maximum consumption of twice this amount. It was not until after the design had reached its final stages, however, that standard basic data on the design of exterior utilities, in the form of a nomograph prepared by the Con-

struction Division, O.Q.M.G., became available. These standards suggested that designs be based on (a) an average water consumption of 100 g.c.d., (b) a peak water consumption for the design of pipe lines of 250 g.c.d. and (c) for the design of sewers, a peak flow of 70 g.c.d. over an 8 hour period.

For the design of sewage treatment works reference is here made to a report to the Construction Division, O.Q.M.G. submitted in December, 1940, by the engineering firms of Greeley & Hanson and Metcalf & Eddy. While this report was not available until construction of the sewage treatment works at Camp Edwards was nearing completion, the following section dealing with sewage quantities may be of interest:

The average quantity of sewage at camps and cantonments is estimated by the Construction Division to be 70 gal. per capita per 24 hours. This, in our opinion, is a reasonable quantity of sewage, perhaps high rather than low. Although most of the 70 gallons may be discharged during 16 hours, all rates are expressed on the 24 hour basis. The fact that most of the sewage flow may occur within 16 hours has been taken into consideration in the establishment of liberal detention periods based on a 24 hour average flow.

It is known that there will be sharp deviations in the rate of flow. . . . We recommend that sewage treatment projects be designed to provide for a maximum quantity of sewage, lasting for several hours of twice the average quantity, or at a rate of 140 g.c.d. Hydraulics of treatment plants and other affected parts of the design should provide maximum quantities, lasting for an hour or less, of 2.5 to 3.0 times the average, depending upon the size and arrangement of the camp and the steepness of the sewers.

The water supply at Camp Edwards is from four new 90 ft. gravel-wall wells and from some 35 small driven wells constructed in 1936 under the National Guard. The latter wells are now held in reserve for emergency use only. Four pumps drawing from the new wells have a total rated capacity of 4.9 m.g.d. However, under present conditions the pumping heads are less than were pro-

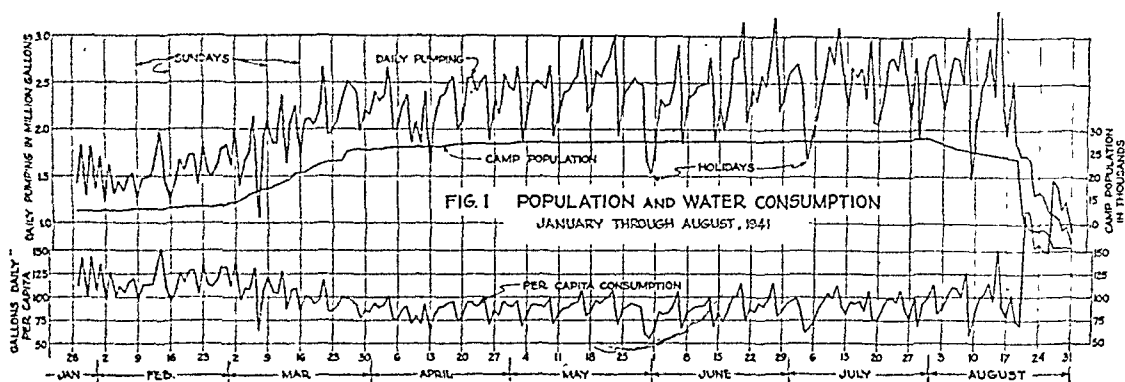


FIG. 1 POPULATION AND WATER CONSUMPTION  
JANUARY THROUGH AUGUST, 1941

vided for in the design and these pumps are now capable of delivering water at a total rate of about 6.5 m.g.d. Storage is provided by four elevated steel tanks having a total capacity of 1.2 million gallons. The water distribution system consists of some 32 miles of cast iron mains ranging from 4" to 14" in diameter, and 15 miles of 2½" and 1½" service connections.

The sewerage system, including building connections, consists of about 40 miles of 6" to 18" sewers, all of vitrified tile except about 2 miles of cement-asbestos pipe and about ¼ mile of cast iron. Except in one pumping district, sewage flows by gravity to a 24" outfall sewer, about ½ mile in length and thence to a sewage treatment plant. All lateral sewers in regimental areas were designed to handle a maximum flow of 400 g.c.d. while main sewers on the lower part of the system were designed for a maximum flow of 300 g.c.d. The 24" outfall sewer, which was previously constructed under the National Guard, has a capacity of 230 g.c.d. when surcharged to the invert of the lowest entering sewer. These rates appear to be rather high, but they are actually lower than would have been used had certain official military advices been followed without considerable discussion. The rates are based on a population of 30,000, and in the design of both sewers and water mains a 50 per cent increase in population was always considered a possibility.

The sewage treatment plant consists of a comminutor, a grease-skimming flocculation tank, Imhoff tanks, bio-filters, and final settling tanks. The disposal of the final tank effluent is by percolation into natural deposits of sand and gravel through 12 acres of intermittent sand filters; this being the only feasible method of final disposal for this locality. The sewage treatment plant is designed for a population of 30,000, an average flow of 3.0 m.g.d. and a maximum flow of 6.0 m.g.d.

Metering equipment was provided in both the water supply and the sewage treatment works. At each of the four new wells there are an orifice meter and an integrating flow recorder. Recording altitude gauges are provided near the elevated storage tanks which give a continuous record of the volume of water in storage. At the sewage treatment works there is a control section meter, similar to a Parshall flume, to measure and record sewage flows.

So few reliable data were available for the design of water and sewer lines serving unit regimental areas that recommendations were made for the installation of meters on the water lines in one or two such areas. At relatively small cost meter records would have given valuable information regarding peak rates of water consumption in small, thickly populated areas which would have been useful in laying out future cantonments. Unfortunately, official approval for the installation of

these meters was not given and thus far none have been installed.

Water consumption records for the camp as a whole have been available since January, 1941. The daily consumption from January through August is shown in Figure 1, together with the camp population, and the estimated per capita consumption. It is seen from this chart that during the early months, when the number of troops was under 15,000, the average consumption varied from 110 to 120 g.c.d. This rate gradually diminished as the camp population increased, with a minimum consumption of 80 g.c.d. being reached during one week in April when the camp population had risen to 26,000. Later, during June, July, and the first weeks of August, when the camp population varied between 27,000 and 28,000 the consumption increased to about 95 g.c.d., based on weekly consumption records, including Saturdays and Sundays but excluding holidays. During the third week in August there was a marked drop in the camp population and water consumption, as a result of extended maneuvers of the 26th Division at Fort Devens. During the last 5 days of August when the troop population was reduced to about 5,000, the average water consumption increased to 195 g.c.d. Actually, however, the number of persons using water during this period was in excess of 5,000. A certain amount of construction was being carried on which required water for both the workers and the construction operations. Furthermore, this 5 day period included a week-end with the usual influx of visitors. Thus, the actual per capita consumption during this period was probably somewhat less than the 195 g.c.d.

It is also seen from Figure 1 that the daily water consumption varies considerably during the week, falling off on Saturdays and Sundays when large numbers of troops are away on furlough,

and reaching a peak on Fridays when preparations are being made for these week-end furloughs. Furthermore, prior to the extended maneuvers in August, a large number of troops were absent\* from camp two or three days at a time on short maneuvers. Water consumption data from April to July, inclusive, when the camp population was relatively stable (varying between 26,000 and 28,000) are summarized as follows:

	Rate of Consumption	
	m.g.d.	g.c.d.
Average, excluding Saturdays, Sundays, and holidays	2.54	94.0
Average of maximum daily consumption each week	2.82	104.3
Average daily consumption during maximum 7 day week ending July 26	2.58	92.3
The same, but excluding Saturday and Sunday	2.71	97.0

As explained later, the daily sewage flows followed the same fluctuations as the water consumption, but were invariably lower except in rare instances when sewer manhole covers were removed illicitly to drain off surface water before adequate surface drains were available. During the month of July, 1941, the average water consumption was 2.50 m.g.d. and the average sewage production was 2.37 m.g.d.

Reliable data showing hourly water consumption rates are not available. However, sewage flows as recorded at the sewage treatment plant give an indication of the fluctuations in water consumption for the camp as a whole during the 24 hours of the day. The variation in sewage flow is illustrated in Figure 2 which has been prepared from the flow chart for June 20, 1941, when the total flow was 2.8 mil. gal. It is seen from this chart that a peak rate of 4.6 m.g.d. is reached at about 7 a.m. The flow then decreases to a rate of 2.3 m.g.d. at 11 a.m., rises to another peak following the noonday meal, and then falls off during the early afternoon. At

\* The population figures shown in Figure 1 have not been corrected for these absences.

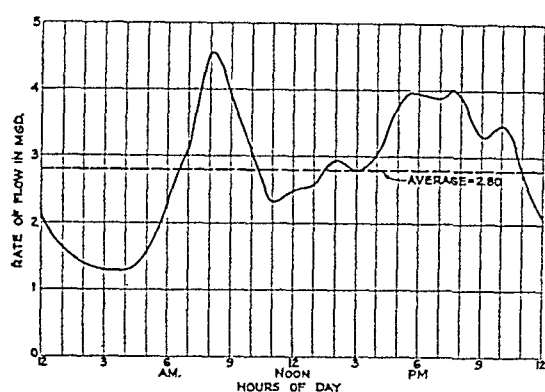


FIG. 2 SEWAGE FLOW CHART  
FOR JUNE 20, 1941

3 p.m. the flow commences to rise, reaching a rate of 4 m.g.d. at about 7:30 p.m. The rate then falls off until 9 p.m., increases slightly until 10 p.m., and then recedes gradually until 3 a.m. when it reaches its minimum rate of 1.3 m.g.d. The peak sewage flows and the hours of their occurrence are influenced by storage in the sewerage system and the time of flow from the extreme ends of the system to the sewage treatment plant. For this reason the peak sewage-flow rates (Figure 2) are lower than the peak rates of water consumption and occur 1 to 1½ hours later.

The design of main sewers serving regimental areas was based upon certain assumptions regarding the effect of the rigid daily routine of troops upon sewage flows. Recalling the deficiency of

factual data when the sewers were being designed, flow measurements were made in April, 1941, in two sewers, one serving a so-called regimental area having a troop population of 1,100, and the other serving the camp hospital area having a resident population of 1,570. Weirs were installed in sewer manholes and flow measurements were recorded periodically during 24 hours for each area. The flow measurements for the regimental area are shown in Figure 3 and those for the camp hospital in Figure 4.

Referring to Figure 3, the average sewage flow from the regimental area was 90.5 g.c.d.; the maximum flow, occurring at about 7:20 a.m. was 196 g.c.d.; the minimum flow, occurring between 3 and 4 a.m. was 51 g.c.d. From midnight until about 5 a.m. the flow was close to the minimum rate; between 5 and 6 a.m. the rate increased sharply, and beyond this point the fluctuations conformed well to the daily routine of the troops. In general, each mealtime was preceded and followed by a sharp rise in sewage flow.

Referring to Figure 4, the average flow from the camp hospital was 80.7 g.c.d.; the maximum rate of 148 g.c.d. occurred at about 9 a.m.; the minimum

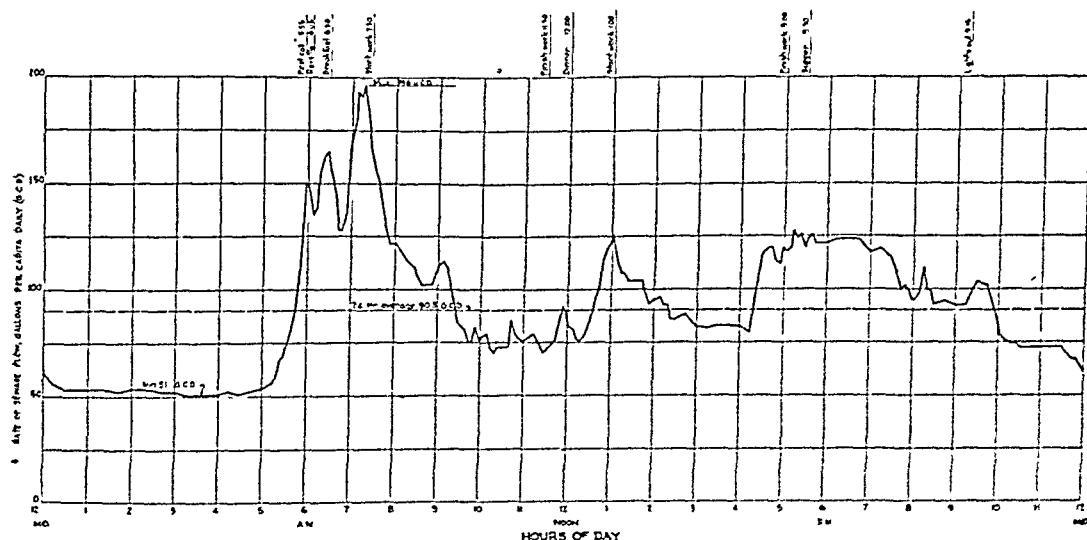


FIG. 3 VARIATION IN SEWAGE FLOW FOR TYPICAL REGIMENTAL AREA HAVING TROOP POPULATION OF 1100



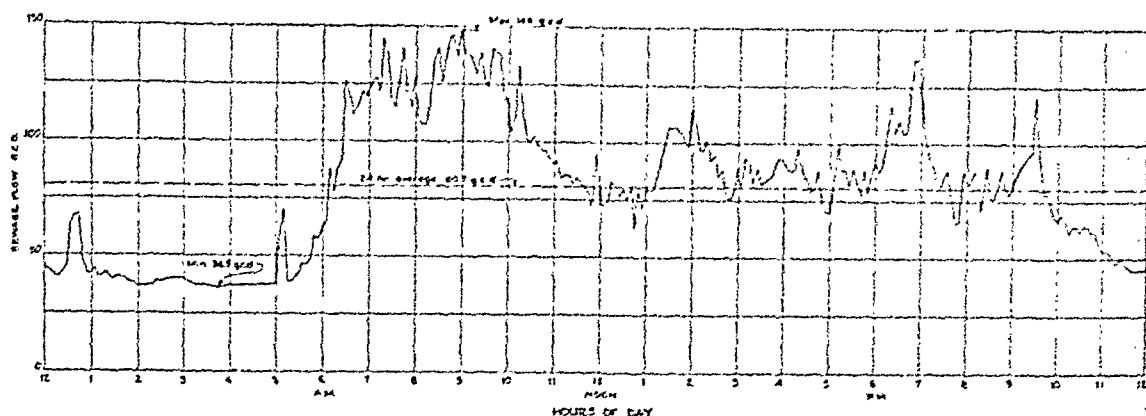


FIG. 4 VARIATION IN SEWAGE FLOW FOR HOSPITAL AREA HAVING RESIDENT POPULATION OF 1570

rate of 36.5 g.c.d. occurred between 3 and 4 a.m.

A comparison of Figures 3 and 4 shows a higher water consumption and sewage flow in the regimental area than in the camp hospital area. This is explained, in part at least, by differences in the operation of the plumbing fixtures. The barracks in all regimental areas have continuous-flushing trough urinals, whereas there are no such urinals in the hospital buildings. Last winter when troops began to arrive at the cantonment in force it was believed that water consumption rates were excessive. That this apparently high consumption was due to leakage in the distribution system seemed improbable. Following the laying of water mains each line was tested under pressure in accordance with standard practice and was made tight before the trench was backfilled. As soon as the high rates of consumption became known a waste survey was undertaken, with barracks, mess halls, and other buildings inspected both during the day and night. It was found that water faucets were left open in many barracks and other buildings, and that numerous toilet flushometer valves were discharging continuously. Orders were then issued to correct the condition and the necessary adjustments and repairs were made. Measurements of the quantity of water used by the trough-urinals showed an average con-

sumption of approximately 2 gal. per minute per urinal.

Following this survey consideration was given to other methods of urinal flushing, and ultimately a decision was reached to change from continuous to intermittent flushing by the use of flushometer valves. Although this change has not been made as yet, it is probable that the new valves will permit a marked reduction in water consumption and sewage flow wherever the urinals are used.

Referring again to Figures 3 and 4, it should be recalled that the peak sewage flows are influenced by storage in the sewers. Peak rates of water consumption in these areas would be higher than the peak rates of sewage flow. The average rates of water consumption in the two areas also would be higher than the average sewage flows since all of the water consumed does not reach the sewers, particularly that used for washing trucks and for sprinkling newly seeded ground. All of the sewers at Camp Edwards are well above the ground water table and, for the most part, lie in a sand and gravel soil; hence, the sewage flows are practically unaffected by ground water infiltration. While the sewers should be reasonably tight, having been laid with sulfur compound joints, any leakage that might occur would tend to be outward rather than inward.

It is hoped that the water consumption and sewage production data presented in this paper will prove to be helpful to engineers and others concerned with the design of utilities for future cantonments. In using these data, however, it should be borne in mind that there may be important differences in water requirements even for cantonments of the same general character. For example, at Camp Edwards plans called for a post laundry at the time the water and sewerage systems were being designed, but the laundry was never built. Where cantonments have such laundries, water requirements and sewage flows will be measurably higher. Again, ground water conditions on Cape Cod are favorable to the construction and operation of sewers, whereas at other cantonment sites appreciable allowances may have to be made in the design of sewers and sewage treatment works for ground water infiltration. Camp Edwards is built on an almost level terrain, and elevated tank storage gives a relatively uniform static water pressure of approximately 60 lb. per sq. in. Where the terrain lends itself to other forms of storage, pressures may be higher or lower than this amount, either of which condition will affect water consumption rates. Water consumption may also be increased appreciably by refueling at air

fields where the "Aqua" system of gasoline displacement is used. While this was not an important consideration at the Camp Edwards air field, the use of water for this purpose should not be overlooked where large numbers of planes must be refueled. The "Aqua" system used at two moderate sized military air fields in New England requires water for gasoline displacement at the rate of about 350,000 gal. in 4 hr., equivalent to a rate of 2.1 m.g.d.

Probably the most important consideration of all with regard to ultimate requirements of water and sewerage works is the possible expansion of a cantonment. No specific allowance was made for this factor at Camp Edwards, but an ultimate population of 45,000 troops was considered to be a reasonable possibility in view of 1917-1918 experience.

While, officially, no authority was given to provide for such a population this possible degree of expansion was not ignored either in the design of the water works or the sewerage system. The saving grace in the performance of many a municipal water or sewerage works has proved to be the factor of safety given by the allowances used for the future growth of the municipality, a factor of safety which the designer of similar works for an army cantonment cannot safely ignore.

# The Relationship of Vocational Rehabilitation to Industrial Hygiene<sup>\*</sup>

DAVID AMATO

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I AM very glad to have this opportunity to express some of my personal views on the relationship of vocational rehabilitation to industrial hygiene. As one who has benefited from a federal-state program of vocational rehabilitation, I have good reason to feel that my discussion is not merely theoretical. You will understand that I speak as an individual and that my ideas on this subject are not to be taken as necessarily representing the official policy of the Wage and Hour Division.

## SIZE OF THE PROBLEM

Despite preventive measures and methods of treatment devised in recent years, the number who become disabled each year from industrial and non-industrial injuries and disease is enormous. The Division of Vocational Rehabilitation of the U. S. Office of Education reports that 800,000 persons become permanently disabled every year because of congenital defects, accidental injury, and disease. Latest figures of the Bureau of Labor Statistics on industrial injuries in the United States indicate that in 1940 nearly 90,000 persons suffered some permanent impairment and 1,782,000 persons temporary disabilities. The total time lost from these injuries alone, according to the Bureau of Labor

Statistics, was 125,240,000 man-days. The National Safety Council, in its 1941 edition of *Accident Facts*, reports that accidental injuries reached the staggering total of 9,100,000 in 1940.

## METHODS OF TREATMENT

Without enumerating the economic costs resulting from this human waste, since it is obvious from the figures just quoted that the total cost would be astronomical, let us see what society has done to cope with this social problem. First, we have stressed preventive programs designed to reduce to a minimum health and safety hazards in industrial as well as non-industrial environments. I hardly need to tell you of the progress that has been made in this regard or stress the importance of prevention. Second, as evidenced by the many clinics and sanatoria for the medical treatment of injuries and diseases, we have recognized a social responsibility for making such services available to wage earners. Largely due to your interest in physical rehabilitation, many employers have recognized the value of an industrial medical and health program. Third, in our efforts to restore disabled workers to normal life, we have attempted, although on a very limited scale, to rehabilitate vocationally physically disabled workers and to restore their earning capacity. Of the three methods of treatment of this

<sup>\*</sup> Read before the Industrial Hygiene Section of the American Public Health Association, at the Seventieth Annual Meeting in Atlantic City, N. J., October 17, 1941.

problem, vocational rehabilitation has attracted the least attention and its importance has been the least appreciated. Although vocational rehabilitation as a social responsibility has been accepted by all the states, the federal government, and private philanthropic agencies, only about 15,000 physically handicapped persons are vocationally rehabilitated annually by the federal-state program and some 15,000 by philanthropic organizations.

The task of restoring the injured worker to normal life naturally starts with providing him the necessary medical or surgical care. But it should not stop there. Frequently, such a worker may not be able to return to the labor market without undergoing a program of guidance and training designed to restore his former vocational efficiency, or to direct his interests toward other pursuits better adapted to his talents. The total task of rehabilitation is not completed until the patient is again economically self-supporting. Failure to recognize this may be wasteful. The emotional conflict which arises when the individual feels that only a life of dependency stares him in the face may undo the benefits of the medical attention he has received. Physical rehabilitation without vocational rehabilitation is simply unfinished business. And it is often a bad investment.

#### SALVAGING INDUSTRIAL MAN POWER

Recent increases in the demand for skilled labor, arising out of the defense program, have emphasized the need for action in salvaging much more of this human waste. Reports from England indicate a growing interest in rehabilitation in the Ministries of Labor and Health. Commenting on rehabilitation as a defense measure, the *London Economist* of November 2, 1940, has this to say:

Rehabilitation has been defined as the process of reconditioning which will be required

in certain cases after clinical treatment in order to obtain full restoration of working capacity. It means more than medical recovery; it involves not simply patching up of the injured person at home or at a clinic, but seeing that his ability to work is restored. Its importance is not simply humanitarian. It is economic; and the bringing back of disabled men and women into work with full output and full earnings was never more needed than at this stage of the present conflict of industrial man power.

In 1932, Roy Anderson undertook a study of the placements made by the Employment Center for the Handicapped in New York City. In his book, *The Disabled Man and His Vocational Adjustment*, published by the Institute for the Crippled and Disabled, Mr. Anderson used 4,404 cases of men with various orthopedic disabilities, all of whom were placed without being vocationally rehabilitated. This study revealed the tendency on the part of those who held jobs in the skilled and semi-skilled groups before disablement to drop down the scale into work of an unskilled nature. Specifically, 25 per cent had been skilled and 23 per cent had been semi-skilled workers before disablement. After disablement, only 6 per cent held skilled and 12 per cent semi-skilled jobs. This situation is wasteful of skill and training under any conditions; under present circumstances, with certain skills at a premium, it is tragic, not only from the viewpoint of the disabled worker but from that of the public interest. And the waste is increasing, for the Bureau of Labor Statistics reports that in each of three vital defense industries—machine tools, aircraft production, and shipbuilding—the number of disabling injuries per million hours worked increased by about 22 per cent in 1940 over 1939.

#### ECONOMIC AND SOCIAL BENEFITS OF VOCATIONAL REHABILITATION

Every successful effort toward vocational rehabilitation and placement of handicapped workers can be justified

on the basis of dollars and cents without recourse to sentimentality. The cost of supporting a disabled adult in idleness is generally estimated to be upward of \$500 a year, whereas a single expenditure averaging \$300 or less could have made him self-supporting. Thus, besides eliminating the high cost of institutional and private care, the vocational rehabilitation of the handicapped would add millions of dollars to the national income. The Division of Vocational Rehabilitation of the U. S. Office of Education, which coöperates with all of the State Vocational Rehabilitation Bureaus, estimates on the basis of experience over the last 20 years that the average earnings of a disabled worker after rehabilitation is about \$1,000 a year. Multiply this figure by 150,000 (the number rehabilitated by the federal-state program since 1920) and the combined earnings of such workers represent an annual income of about \$150,000,000. And while adding \$150,000,000 to the nation's income, we have saved \$75,000,000 which otherwise would have been spent for the care of these people.

Various studies have indicated the wide variety of useful occupations in which disabled workers may be trained advantageously. One made by the Division of Vocational Rehabilitation lists 628 different types of jobs held by physically handicapped persons. Because of the scientific treatment of the training and placement problems of the handicapped worker, it is not surprising to find that he is often more successful than the able-bodied. He is trained and placed in a job where he is happy and where his disability will interfere least with the performance of the duties required.

#### VOCATIONAL REHABILITATION AS A PART OF THE INDUSTRIAL HEALTH PROGRAM

At the Special Conference of State and Territorial Health Officers with the

U. S. Public Health Service on September 16, 1940, Dr. Paul A. Neal of the Division of Industrial Hygiene, National Institute of Health, outlined a specific program of industrial hygiene in which he listed also the necessity for a "determination of methods for the absorption of handicapped persons into vital industries for national defense." Although Dr. Neal did not indicate how this would be accomplished, it is obvious that, in order to qualify, many of these workers will have to be vocationally rehabilitated. One of the ways this may be done is to include vocational rehabilitation as part of an industrial health program. Since many employers already have acknowledged their interest and responsibility in physical rehabilitation, and since physical rehabilitation without vocational rehabilitation is unfinished business, it follows logically that such employers should wish to participate in the vocational rehabilitation of their disabled workers as a part of their medical and health programs.

Because of the medical and work records it accumulates, an industrial medical unit would appear to be in an excellent position to plan and effectuate the training and placement of physically handicapped workers. A survey of each job in the establishment would determine, among other things, the physical requirements of each job. Such data, together with the medical diagnosis and prognosis and an appraisal of the worker's abilities, capacities, interests, and occupational history, would serve as a basis for charting the program. Possibly one of the best advantages of such a program in industry is that the resulting coöperation between the medical and personnel units would facilitate the training and placement of disabled workers with the least possible delay. This in turn would reduce the conflict which so often disorganizes the personality and would assure success in the total task of restoring the individual to

his independent place in society. Such a program would certainly eliminate to a large degree the fear of dependency and insecurity that is in the minds not merely of the handicapped but of all workers.

An employer primarily interested in the efficient operation of his plant surely should want to know something about the general performance of handicapped workers and what to expect so far as accidents are concerned. Fortunately, there is a considerable body of data to satisfy any employer's interest. The actual performance of such workers as compared to non-handicapped employees has been shown to be very favorable. In 1932, the Western Electric Company of Kearny, N. J., made a comparison of about 652 disabled workers with a similar group of non-handicapped employees doing the same types of work. Resignations, absences due to sickness, and discharges for cause were found to be from 7 to 8 per cent higher among the non-handicapped than among the disabled, and there were 5.6 per cent fewer accidents among disabled workers.

Employers are frequently reluctant to employ handicapped workers because of the fear of having to pay a higher compensation rate. These fears have no basis. The initial compensation rate generally is fixed for the industry as a whole and the total cost is based on the number of employees, occupations, and pay roll. No information is generally required regarding the physical condition of the employees. The rate is later adjusted on the basis of the plant's experience. The claim that the experience must necessarily be poor if handicapped persons are employed has not been substantiated. The Ford Motor Company, as an example to show that the contrary is generally true, employs more than 10,000 physically handicapped workers and reports that it has the lowest compensation insurance rate in the automotive industry. Since in an

industrial vocational rehabilitation program the placement and training of such workers would be based on the physical requirements of each job, the accident risk could be reduced to a minimum.

J. W. Dietz, author of the article entitled "An Experiment with Vocationally Handicapped Workers" which appeared in the February, 1932, issue of the *Personnel Journal*, made the following conclusion regarding the Western Electric Company's experiment:

Based upon the data presented thus far in this paper, we are of the opinion that there is no real reason why people possessing certain vocational defects should not be employed by large industrial concerns. The results of our year's experience with vocationally handicapped workers were sufficiently satisfactory to make their acceptance a part of the standard practice of our Medical Department.

Likewise, as a result of our experience gained in working with the vocationally handicapped employees, significant changes took place in our thinking regarding other phases of our rehabilitation problem.

It occurred to us that we had not exercised the same care in providing an adequate placement and follow-up routine for employees who were impaired with sickness or injury while in the employ of the company.

A follow-up and placement program can be effectuated with the least possible cost and with the maximum advantage to employers and disabled workers alike. Although the services of a rehabilitation consultant would be valuable and justified in the larger establishments, a close coöperation between the medical and the personnel departments could obviate the appointment of rehabilitation specialists in most concerns that would establish and carry out this program. In either case, after a worker had been physically rehabilitated, the medical and work records would be available to the personnel interviewer in the guidance and placement of the worker. Essential to this program is the coöperation possible with private and public vocational rehabilitation agencies whose accumulated

knowledge and experience would be invaluable.

The Division of Industrial Hygiene of the National Institute of Health and the State Industrial Hygiene Agencies might well formulate a skeleton outline showing the place and functions of vocational rehabilitation in an industrial health program. Additional research could profitably be conducted as to methods and measures for meeting the particular needs of employers.

#### CONCLUSION

I am frequently asked, "If vocational rehabilitation is as practical as you say it is, why hasn't it been more widely appreciated?" There are many answers to that question. I have tried in my discussion of the relationship of vocational rehabilitation to industrial hygiene to give one answer. Perhaps the greatest handicap to progress has been

that we have permitted our sentiment to run away with our reason. We have been inclined to overlook the fact that, once the physical disability has been treated, the central problem is that of restoring earning capacity so the handicapped persons may become self-supporting. Since the return of such a worker to the labor market should be the ultimate goal, we must recognize our work as unfinished when it stops short of that. We must show employers that it is to their economic advantage to complete the job. We must impress upon them the fact that they have developed equities in workers who become disabled, and, as in the case of a machine, they will profit when they repair the worker rather than discard him. If we succeed, we will have done much to make social and economic assets out of many present human liabilities.

# The Public Health Engineer in the Emergency\*

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HEALTH is at all times of major importance to the individual and to the nation of which he is a part. In the event of a national emergency, fitness, both physical and mental, becomes of paramount importance, because it is man power that determines the capacity of the nation to produce weapons of freedom and to use these weapons.

Health, from the personal or individual point of view, is a condition of well-being that determines capacity to work, to play, to be happy and useful. As the nation is made up of individuals, it is obviously true that in order to raise the standards of national health, we must promote individual physical and mental health.

Public health, though a comparatively new art, has passed through several well-marked phases of development. Public health is practical in its outlook. "The greatest good for the greatest number" is an axiom that cannot be lost sight of when determining the best use of public health funds and personnel.

At any particular period, the scope of the public health program is limited by the knowledge which has been made

available concerning the prevention of disease and the promotion of health. In fact, it may be said that the real purpose of public health is to bridge the gap which exists between knowledge and practice, and so minimize the loss of productive lives and capacities.

Public health as we know it today developed as part of a general movement for social reform, the aim of which was to correct some of the unfortunate results of industrialization. The public health pioneers saw disease, poverty, and filth going hand in hand. The emergency they faced grew out of the industrial revolution when the new factory workers came to live in the industrial centers which sprang up and which were entirely lacking in sanitary facilities.

The public health reformers sought to lighten the burden that was crushing the people, through the institution of sanitary measures which they believed would prevent many of the prevalent diseases. Their chief error lay in the belief, universal at that time, that disease breeds in filth instead of being carried in filth. They did not appreciate the actual and potential dangers in the excretions and secretions of the human or animal body. Nevertheless, through their energetic efforts, much was accomplished.

Following upon the epoch making dis-

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\* Read before the Conference of Municipal Public Health Engineers, at Atlantic City, N. J., October 13, 1941, during the Seventieth Annual Meeting of the American Public Health Association.



coveries of Pasteur and his coworkers, attention was focused on the control of the communicable diseases. Spectacular progress has been made in the control of many of these, notably those which are spread chiefly by water, milk and food, and by insects. It has been with those communicable diseases, the spread of which is direct from man to man, that the results have in general been disappointing unless active immunization has been possible. Despite the progress which has been made, sickness remains as the major hazard for the masses of the people, including the industrial wage earners.

With the relative control of many of the major epidemic diseases, such epidemics have ceased to be the chief concern of public health. Attention has been gradually directed toward the improvement of health as distinct from the prevention of disease. This required the spread of health knowledge to the general public in such a manner as to bring about the practice of this knowledge by the people as an integral part of their everyday living.

In the enthusiasm for health education and the solution of the health problems of the individual, there was for a time, in many places at least, a tendency to discount the importance of environmental conditions as fundamental to all health work, and to overlook the need for making it reasonably possible for people to practise what they were being taught, through the provision of sanitary facilities.

It might be said that public health is interested in every phase of individual and national life because every phase has some influence on health. Undoubtedly, the greatest public health problem is poverty. Together with poverty, we find ignorance, undernutrition, high morbidity and mortality rates. It is not, however, our problem as public health workers to deal with poverty as such.

In making the decision as to where our responsibility lies, we must avoid falling into the error of thinking that just because we know how to do a certain thing, it is necessarily done. For many years, we have known that milk supplies can be made safe through inspection plus pasteurization. In spite of this, much raw milk is still being sold, and the supervision of many dairy farms and pasteurization plants is still inadequate.

Another error to be avoided is the presumption that because water supplies in most of the larger centers of population are now safeguarded, the same must be true of the smaller towns and rural areas.

The emphasis of the public health program will vary from area to area, depending upon such factors as population, climate, economic conditions, and so on. There is no one standard program which will best meet the needs of all areas. The general purpose is always the same: the prevention of preventable diseases and the improvement of physical and mental health, leading to increased years of health and happiness.

There are certain basic public health requirements, provision for which must be made in all areas at all times. It is the means for providing these services which will vary from place to place and from time to time. Everyone should have available for use safe water, safe milk, facilities for personal cleanliness and for the storage of perishable foods, to mention but a few items which come readily to mind.

With what I have said for a background, we come to face the present-day emergency. We find ourselves living in an armed camp either preparing for or actually engaged in a struggle to preserve everything which we believe makes life worth while.

Under such circumstances, we are challenged, as individual citizens and as

members of public health organizations, to make our most effective contribution toward the national effort to meet the emergency.

I need hardly remind this group that public health includes in its personnel men and women with various professional basic trainings. From each it is expected that he or she will bring to his or her public health duties a capacity to apply technical knowledge to the solution of public health problems. The public health engineer, by reason of his professional training in engineering, is the staff member who is expected to give leadership in the designing, construction, or operation of those facilities which come under the general heading of environmental aspects of disease prevention and health promotion.

The value of the public health engineer, or indeed of any member of the public health organization, lies not only in his professional ability but also in his capacity for and his willingness to become a member of a team which will work in harmony, having the public health as objective. I emphasize this latter point because at a time when the emergency gives rise to many problems of jurisdiction and other irritants, it requires more than a fair degree of the coöperative spirit to avoid friction and not to lose sight of the common objective.

The state of emergency has brought about many changes of public health significance, creating problems but, at the same time, offering opportunities to advance public health.

Shifts of population with the setting up of military camps and defense industries in new areas, or the sudden expansion of population in small centers cannot take place safely without the safeguards which public health, largely through public health engineering, has to offer.

The public health engineer—and I am using that term to include the sanitary

engineer—does not approach his problems alone. He is associated with the bacteriologist and the epidemiologist, for example, in many matters, but, nevertheless, it is upon his shoulders that the major responsibility for environmental conditions must rest.

In the present emergency, public health engineering, as a part of public health, has to consider three major questions: (1) What shall be our attitude toward the maintenance and further development of public health departments? (2) How can we best provide the necessary services for the new defense industries? (3) How can we assist in the provision of essential services for the armed forces?

In most public health matters, a line cannot be drawn between the civil population and the military forces. You will recall how, in 1918 and 1919, influenza swept around the world, sparing neither armies nor neutral nations remote from the war zone.

To whatever extent preventable diseases are allowed to persist and to whatever extent we fail to raise health standards, to a corresponding degree we decrease our ability to meet the emergency.

Man power is, of necessity, the most important national resource available to us in our efforts to deal with the problems arising out of the emergency, from both the military and the civil points of view. Quality of man power depends upon the fitness of the individual, whether in the armed forces, the factory, the farm, or the home.

It is obvious then that not only must there be no slackening in the work of public health departments, but on the contrary, there must be a raising of standards and above all the extension of services to local areas which up to the present have not enjoyed the advantages of adequate public health services.

The effectiveness of a health depart-

ment depends upon two things: the quality of its staff and the adequacy of its budget. No health department can function properly unless it has the leadership, guidance, and services of a qualified public health engineer working in close coöperation with the medical officer of health.

I would say then that the first duty of the public health engineer in the emergency is to do his part as an individual public health worker and as a member of that specialty in public health to promote, develop, expand, and maintain public health engineering services in the official health department organizations.

I do not think that this point can be over-stressed. There is, undoubtedly, going to be serious difficulty in maintaining health department services. There is the natural danger that, under the circumstances, other things may seem to be of relatively more importance. Staff will be lost and difficult to replace. There may develop a tendency to reduce expenditures on public health in favor of what will appear to be more urgent needs.

The responsibility therefore falls upon all public health workers to interpret to the public and to the responsible authorities what the public health departments mean to the nation in the emergency.

It is from the civil population that the armed forces recruit their men; it is from the civil population that defense industries draw their staffs. Thus, it is the health conditions of the civil population which determine the quality of man power available to the armed forces and to industry.

It might be said in all truth that in order to safeguard the health of the armed forces, we must have well organized public health services throughout the whole country. The soldier, sailor, or airman does not stay put. He spends much of his spare time and all of his

leave outside of the militarily controlled area. He eats and drinks in any and every sort of public eating place. Unless these resorts are safeguarded by the health departments, they obviously endanger not only the civil population but also the man in uniform, for the germs of disease do not hold the uniform in awe.

All this brings me to repeat what I said before, namely, that the emergency demands that we press forward in the organization of adequate public health services, particularly for the rural areas, and that we do our utmost to maintain and improve the efficiency of existing services.

A special problem for the public health engineer arises out of the setting up of large and small defense industrial plants in new and sometimes relatively remote areas.

The public health engineer should be consulted as to the selection of sites, and the proper time to consider the question is before the final selection is made. We all know of construction having been started, indeed sometimes finished, before consideration was given to the accessibility of adequate water supplies.

Military necessity may require, at times, the selection of a relatively unfavorable site from the public health point of view, and under such circumstances, the public health engineer must make the best of conditions.

The actual situation in defense industries varies a great deal from place to place. Some plants will be located in comparatively isolated areas with large staffs; in others, the staff will be relatively small. Some plants will be entirely new; others will be an expansion of existing work. The latter are more frequently located in cities or small towns.

Obviously, the public health engineer must be informed as to the nature of the plant, the number of employees,

and so forth, if his part of the planning is to meet the environmental health needs of the situation. Here and in other matters, secrecy is often essential, which means that all must learn to exercise control over their tongues when it happens that, through our work, certain information regarding defense industries comes into our possession.

The industrial defense plants have the same requirements as all other industrial plants with regard to water supplies, sewage disposal, facilities for personal cleanliness, lunchrooms, kitchens, and food storage, as well as adequate provision for lighting and ventilation, and, depending upon the nature of the industry, special protection in connection with dust, fumes, explosives, and so on.

In the isolated plants, sleeping and recreational accommodation may be required, and these for both sexes. In this particular, it is well to keep in mind the importance of the maintenance of morale in which environmental conditions play an outstanding part. If, for example, the plant is one which operates twenty-four hours a day, the fact must not be overlooked that the night workers require quiet sleeping quarters during the day.

Perhaps the most difficult health situation arises in the sudden expansion of an industry located in a small town which lacks satisfactory community sanitary facilities. In such cases, with regard to sanitation, the town itself with its inhabitants cannot be divorced from the plant with its employees. What is needed, under such circumstances, is a joint effort to secure safe and adequate sanitary facilities for both the town and the industry. Under these conditions, overcrowding in dwellings is a particularly difficult situation to meet promptly and satisfactorily, but to neglect doing so will almost surely give rise to an unhappy health situation.

The public health engineer, either as a member of the armed forces or acting

in his civil capacity, should be consulted in the selection of new military camps and the expansion of existing camps.

The attitude of the responsible military authorities toward military training has changed a great deal. The old idea of "hardening" men through needless exposure to cold and wet is now in the discard. In its place has come at least a partial acceptance of the more modern views with regard to education and health.

Perhaps it is the development of mechanized warfare which has emphasized skills rather than strength. Mechanized warfare calls for long periods of training which means that the man, when trained, is particularly valuable and difficult to replace. Safeguarding the health of these men while in training and afterward is highly important to the army, the navy, and the air force.

I mention this change because it means that the public health engineer, in planning for a military camp today, does not merely consider accommodation for eating and sleeping. He must bear in mind that the modern military camp has to a considerable extent become a school which needs classrooms, laboratories, and practise rooms. This demands consideration of lighting, ventilation, and all the other special environmental needs of a school.

I should like to mention also the necessity of keeping in mind provision for expansion, because it seems as though military camps never attain their full growth. Having made adequate provision for the twenty thousand men who were to be accommodated, it is often found that thirty thousand are expected to move in shortly.

From what I have said, it is clear that the public health engineer has an important rôle to play in the emergency. His services are essential to the civil, industrial, and military populations, and this, in effect, means the whole population. The important point in all

this is to make certain that the public health engineering personnel is so distributed as to make the services of the engineer available where and when needed. If this is done, we may rest assured that the contribution of the

public health engineer to defense will meet the needs, and will assure the country of the full advantages in public health which this important member of the public health organization can offer to his country in its emergency.

# Results of Serologic Tests for Syphilis in Non-syphilitic Persons Inoculated with Malaria\*

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THE influence of malaria in producing positive serologic tests for syphilis in patients not infected with this disease has been a controversial question for many years. This problem is of more than academic interest. There is a large malarial region in this country. Those states affected have a large Negro population among whom there is a high prevalence of syphilis. Here, as elsewhere, the diagnosis of syphilis has rested largely upon the serologic test. Therefore, if malaria may produce positive tests in persons who do not have syphilis, it is essential that we know this to prevent false diagnoses and unnecessary therapy.

## REVIEW OF THE LITERATURE

Much has been written concerning the effect of malaria on the sero-diagnosis of syphilis. There is approximately equal division among these reports as to whether malaria actually has any effect. The literature, up to 1938, has

been well reviewed by Hazen and his associates.<sup>1</sup> Only a few of the more important observations will be mentioned here.

Lloyd and Mitra<sup>2</sup> report on 85 cases of malaria in a hospital of Calcutta, 14 per cent of whom had presumably positive reactions for syphilis. They state that this falls within the expected syphilis rate of their hospital population and conclude, therefore, that there is little evidence that malaria causes nonspecific positive reactions when modern technics are used. Kolmer,<sup>3</sup> from his observations and experience, states that malaria has no influence upon serologic reactions, although mentioning that sera from any acute febrile disease may become more anti-complementary than usual. His belief is that errors in technic probably account for reported cases of nonspecificity. These statements were reaffirmed in a subsequent paper,<sup>4</sup> adding that "The occurrence of positive reactions in malaria is presumptive evidence of syphilis."

Saunders and Turner,<sup>5</sup> working with a population in which yaws was prevalent, malaria present, and syphilis rare, found that the percentage of positive reactions was no greater among malarial

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Experiment conducted in the Department of Psychiatric Research, Milledgeville State Hospital, Milledgeville, Ga.

patients than among the general population. They did suggest, however, that acute malaria may act as a provocative agent in raising a low titer reagin to the complement-fixation threshold. Similarly, Canova<sup>9</sup> concluded from his observations that malaria merely reactivates an old syphilitic process and brings out latent and serologically negative syphilitic infections.

Fisher and Ginsberger,<sup>6</sup> Taussig and Orgel,<sup>7</sup> and Wilson and Levin<sup>8</sup> made contrary observations, namely, that malaria may produce nonspecific positive serologic results. Cumming and his coworkers,<sup>10</sup> in a study of 36 cases of presumably non-syphilitic patients with malaria, found a significant percentage of false positive reactions, varying from a low of 11.1 by Hinton to a high of 19.4 by Kolmer. Hazen and his associates reported 8 per cent positive reactions in a study of 266 presumably non-syphilitic white persons with malaria. Stryjecki<sup>11</sup> found in his study of patients with malaria, that 40 per cent gave a false positive reaction for syphilis, although this reaction was transitory.

Several aspects of the papers cited in the preceding review are to be particularly noted. First, and most important, is that none of these observations are really controlled studies, in that they were made either on routine hospital patients or patients in the field in whom syphilis could not be ruled out in all cases. Comparisons of rates were made with the general population. Most of the observations were made using a modified Wassermann technic at a time when the sensitivity of tests was not so high as it is today and the technics were not so well standardized. Finally, in none of the preceding studies were serial tests carried out on the same patient at intervals throughout the course of the infection. The conclusions were usually based on single specimens taken at varying periods in the course of the disease.

The first systematic and controlled study of this problem was made by Kitchen and his coworkers<sup>12</sup> who inoculated non-syphilitic patients suffering from functional psychoses with malaria, using similar patients not inoculated with malaria as controls. Using a complement-fixation and a Kahn test, they found that every case which developed malaria exhibited positive results at some time during the course of the infection. This formed the most conclusive evidence yet presented on the effect of malaria in producing a positive complement-fixation or flocculation test in non-syphilitic patients.

Our efforts have been directed toward further clarification of this apparently confusing problem. The primary purpose of this study was to determine the influence of malaria on the complement-fixation and flocculation tests for syphilis. Secondary considerations were: (a) influence of the stage of the disease, (b) to observe any differences in the several tests used, (c) to determine the effect of duration of the disease, (d) to learn if the number of malarial parasites in the blood or the temperature at the time of withdrawal had any effect on the results, and, finally, (e) to determine the period of maximum titer of the serum as demonstrated by the Kahn quantitative test.

#### METHODS

The laboratories of Eagle, Hinton, Kahn, Kline, and Kolmer kindly agreed to perform the tests bearing those names on all specimens collected in the course of this study. In addition, the Venereal Disease Research Laboratory of the U. S. Public Health Service, under the direction of Sr. Surgeon J. F. Mahoney, also participated, performing the Kahn, Kline, and Kolmer tests on all specimens.

Eleven patients with functional psychoses were inoculated with malaria. Syphilis was excluded by means of history physical examination, two negative

TABLE 1  
*Serologic Pre-testing Results*

<i>Type of Test</i>	<i>Number Positive</i>	<i>Number Doubtful</i>	<i>Number Negative</i>
Eagle Wassermann	0	0	11
Eagle Microflocculation	0	0	11
Hinton	0	1	10
Kahn Standard (Kahn)	0	0	11
Kahn Standard (Mahoney)	0	0	11
Kline Diagnostic (Kline)	0	0	11
Kline Diagnostic (Mahoney)	0	0	11
Kolmer (Kolmer)	0	0	11
Kolmer (Mahoney)	0	1	10

One case had two doubtful reactions to the Hinton test and one case one doubtful reaction to the Kolmer (Mahoney) prior to inoculation. These cases, both of which had positive reactions during the malarial course, were not included in the figures for such tests.

blood serologic tests and one negative spinal fluid. All pre-inoculation specimens were submitted to the above serologists. In addition, 4 controls were selected, 2 with syphilis and 2 without.

Three patients were inoculated with 10 ml. of blood containing *Plasmodium vivax*. The other 8 patients were infected directly by the bite of an infected mosquito. The blood containing the parasites and the infected mosquitoes were obtained from Dr. Martin Young of the Public Health Service Malaria Laboratory at Columbia, S. C. The infected blood was obtained from functional psychotics with malaria who did not have syphilis as proved by negative history, physical examination, and blood and spinal fluid serologic reactions.

There is no evidence that the mosquito may transmit the spirochete of syphilis. Therefore, we can reasonably state that

our patients were inoculated only with *Plasmodium vivax*. The only observed difference between the two methods of inoculation was the longer incubation period where the bite of the infected mosquito was used.

Enough blood was withdrawn from each patient to send a comparable amount to each laboratory in the form of whole blood. This was sent airmail to the participating serologists on the same day as withdrawn and under a code number. Besides the two pre-inoculation specimens, blood was collected once a week during the incubation period, every 4 days during the active stage of the malaria, and again once a week after termination of the disease by the use of quinine, until the serologic reaction became negative. Quinine was given when the patient had had 10 paroxysms. A total of 13 specimens

TABLE 2  
*Number of Persons Having Positive Reactions by Different Tests*

<i>Type of Test</i>	<i>Number Positive</i>	<i>Number Doubtful</i>	<i>Number Negative</i>
Eagle Wassermann	5	1	5
Eagle Microflocculation	4	1	6
Hinton	0	3	7
Kahn Standard (Kahn)	11	0	0
Kahn Standard (Mahoney)	11	0	0
Kline Diagnostic (Kline)	11	0	0
Kline Diagnostic (Mahoney)	9	1	1
Kolmer (Kolmer)	7	0	4
Kolmer (Mahoney)	9	1	0



was obtained when some of the patients were at the height of a paroxysm. Parasite counts were made by the Malaria Laboratory of the U. S. Public Health Service at Savannah, Ga.

#### OBSERVATIONS AND DATA

Table 1 presents the serologic results before inoculation with malaria.

All cases had at least one positive reaction to the Kahn Standard (Kahn), the Kahn Standard (Mahoney), and the Kline Diagnostic (Kline), during or after the malarial attack. The number of persons having positive reactions to the other tests is shown in Table 2.

No positive or doubtful reactions were reported on the negative controls by any of these tests during this period. In cases that were positive, the positive reaction was never an isolated one. Invariably another positive or doubtful reaction was returned on the same case to that particular test. In none of these tests was there a single instance of a negative occurring between the first and last positive reactions, and in only one case (Kolmer-Mahoney) did a doubtful occur during this interval.

Table 3 presents the total positive reactions after inoculation with malaria.

The results of the various tests in the different stages of malarial activity are shown in Table 4. The febrile stage was delimited by the first and last elevations

of temperature to 37.8° C. or 100.0° F. In this table a doubtful reaction was considered as positive if, at the beginning of the stage of positivity, it was followed by a positive blood, or if, at the end of the stage of positivity, it was preceded by a positive blood. One patient had a positive reaction to the blood withdrawn on the day on which first parasites were evident, which was the day before the first paroxysm. With this one exception, no positive reactions were observed prior to fever.

Although the percentage of positive reactions within each stage varied between different tests, in general they all showed the same tendency. During the first week of fever, it varied from 5 per cent in the Eagle Wassermann to 52 per cent in the Kahn Standard (Mahoney). Without exception the percentage of positive reactions in the second week of fever was higher than for the corresponding test for the first week of fever. Again the Eagle Wassermann had the lowest percentage (23) and the Kahn Standard (Mahoney) the highest (87). Only 3 patients had a fever of over 2 weeks' duration and only 4 samples of blood were withdrawn in the 3rd week of fever. The percentage of positive reactions declined after the termination of fever. Only 2 out of 20 samples of blood withdrawn more than 3 weeks after termination of fever were not nega-

TABLE 3

*Total Number of Positive Serologic Reactions After Inoculation with Malaria*

<i>Type of Test</i>	<i>Number Specimens Examined</i>	<i>Number Positive Reactions</i>
Eagle Wassermann	115	11
Eagle Microflocculation	116	16
Hinton	100	0
Kahn Standard (Kahn)	116	48
Kahn Standard (Mahoney)	125	51
Kline Diagnostic (Kline)	133	39
Kline Diagnostic (Mahoney)	125	27
Kolmer (Kolmer)	128	38
Kolmer (Mahoney)	111	38
Total	1,069	268

TABLE 4

*Reactions of Various Tests for Syphilis in Eleven Non-syphilitic Persons Inoculated with Malaria by Stage of Malarial Activity*

Type of Test	Blood Reaction	Before Inoculation	Pre-febrile Stage	Febrile Stage			Post Febrile Stage			
				1-7 days	8-14 days	15-21 days	1-7 days	8-14 days	15-21 days	22 days & over
Kahn Standard (Kahn)	Pos.	0	0	9	12	3	12	9	1	2
	Neg.	35	14	12	4	1	3	8	8	18
	% Pos.	0.0	0.0	42.9	75.0	75.0	80.0	52.9	11.1	10.0
Kahn Standard (Mahoney)	Pos.	0	1	11	13	4	12	8	1	1
	Neg.	21	10	10	2	0	3	9	8	32
	% Pos.	0.0	9.1	52.4	86.7	100.0	80.0	47.1	11.1	3.0
Kline Diagnostic (Kline)	Pos.	0	0	5	10	4	11	6	2	1
	Neg.	27	17	18	3	0	4	11	7	34
	% Pos.	0.0	0.0	21.7	76.9	100.0	73.3	35.3	22.2	2.9
Kline Diagnostic (Mahoney)	Pos.	0	1	4	9	3	7	5	1	0
	Neg.	21	11	16	6	1	8	11	8	34
	% Pos.	0.0	8.3	20.0	60.0	75.0	46.7	31.3	11.1	0.0
Eagle Wassermann (Eagle)	Pos.	0	0	1	3	2	5	0	0	0
	Neg.	29	13	18	10	2	10	16	9	26
	% Pos.	0.0	0.0	5.3	23.1	50.0	33.3	0.0	0.0	0.0
Eagle Microflocculation (Eagle)	Pos.	0	1	2	4	3	4	2	0	0
	Neg.	26	12	15	10	1	11	14	9	28
	% Pos.	0.0	7.7	11.8	28.5	75.0	26.7	12.5	0.0	0.0
Kolmer Complement-Fixation (Kolmer)	Pos.	0	0	3	5	4	8	6	0	0
	Neg.	32	17	15	7	0	7	11	9	36
	% Pos.	0.0	0.0	16.7	41.7	100.0	53.3	35.3	0.0	0.0
Kolmer Complement-Fixation (Mahoney)	Pos.	0	0	6	9	4	10	7	2	0
	Neg.	18	12	12	3	0	3	8	6	29
	% Pos.	0.0	0.0	33.3	75.0	100.0	76.9	46.7	25.0	0.0
Hinton (Hinton)	Pos.	0	0	0	0	..	0	0	0	0
	Neg.	22	14	13	9	..	12	13	8	31
	% Pos.	0.0	0.0	0.0	0.0	..	0.0	0.0	0.0	0.0

tive to the Kahn Standard (Kahn), 1 out of 33 to the Kahn Standard (Mahoney), 1 out of 35 to the Kline Diagnostic (Kline), and all other tests were negative.

The duration of positivity varied greatly between patients and between different tests applied to the same patient. In Table 5 a doubtful reaction was counted as positive if, at the be-

TABLE 5

*Average Duration of Positivity of the Various Tests for Syphilis in Relation to Clinical Activity of Malaria*

	Duration of Positivity in Days	Days from First Parasites to First Positive Blood	Days from Start of Quinine to Last Positive Blood
Kahn Standard (Kahn)	18-23	5-7	9-14
Kahn Standard (Mahoney)	17-30	5-7	8-15
Kline Diagnostic (Kline)	14-24	7-9	8-15
Kline Diagnostic (Mahoney)	11-19	7-10	7-12
Eagle Wassermann	5-11	10-13	2-6
Eagle Microflocculation	14-21	8-10	6-10
Kolmer (Kolmer)	12-20	7-10	6-11
Kolmer (Mahoney)	18-26	6-8	10-15
Hinton (Hinton)		No Positives Reported	

The two sets of figures represent the minimum and maximum durations. One figure is based on the first and last recorded positive blood, the other on the last negative prior to the period of positivity, and the first negative after this period. The difference represents the time between tests in which the blood reaction is unknown.

ginning of the stage of positivity, it was followed by a positive blood or if, at the end of the stage of positivity, it was preceded by positive blood. Figures for the average known and possible durations of positivity for each type of test are given.

In Table 6 are the corresponding figures for the longest number of days of positivity. With the exception of the Kahn Standard (Mahoney) and Kolmer (Mahoney) on the same patient, no known duration of positivity extended over a period longer than 4 weeks.

The longest duration of febrile activity was 18 days and the shortest 7, with an average of 13 days. There was

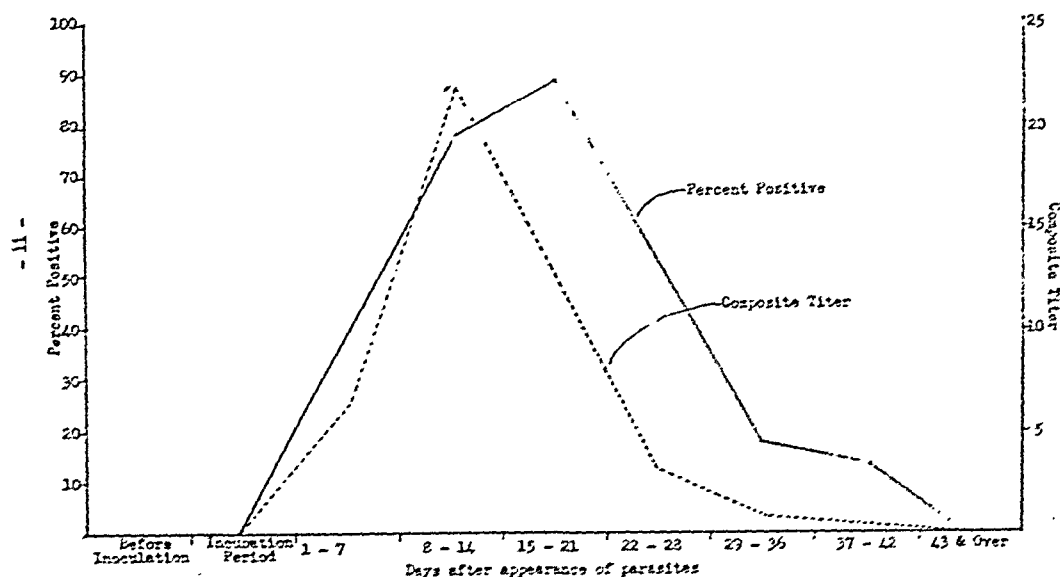
no apparent relationship between the duration of clinical activity and of positivity, nor was there any evidence that the longer duration of positivity was always associated with its onset early in the malarial stage. The only definite finding was that the patients with the longest durations of positivity remained positive for the longest periods after the administration of quinine. In Chart I the percentage of positive reactions to the Kahn Standard (Kahn) is plotted by time-period after appearance of parasites. It increases to the maximum of 88 in the 3rd week after the first parasites, and then declines, all cases being negative by the 7th week.

TABLE 6  
*Duration of Positivity*

<i>Name of Test</i>	<i>Known Duration</i>	<i>Possible Duration</i>
Kahn Standard (Kahn)	27	40
Kahn Standard (Mahoney)	29	56
Kline Diagnostic (Kline)	27	51
Kline Diagnostic (Mahoney)	19	41
Eagle Wassermann (Eagle)	7	14
Eagle Microflocculation	20	32
Kolmer (Kolmer)	19	40
Kolmer (Mahoney)	36	44

CHART I

Percentage of Positive Reactions and Composite Titer of the Kahn Standard Test for Syphilis in Nonsyphilitic Persons Inoculated with Malaria by Time Period After Appearance of Parasites.



The height of the peak temperature could not be shown to influence either the duration of positivity or the number of technics giving a positive result. Three cases positive to all tests except the Hinton had peak temperatures of 106.4°, 105.0°, and 106.2° F. Four cases never positive to four tests each had peak temperatures of 105.6°, 106.2°, 105.0°, and 106.4° F.

Consideration was given to the time-period from inoculation to appearance of parasites and its possible relation to the positivity of the blood. It was found that the 3 cases with the longest intervals remained seropositive for longer than the average period. Conversely, the 3 cases with shortest time-period between inoculation and the appearance of parasites remained seropositive for less than the average period. It is seen in Table 5 that on the average the Eagle Wassermann had the longest duration from the first appearance of parasites to the first positive blood.

The reactions to the various tests were studied at the time most tests showed positive, that is, at the time of maximum positivity on the basis of all the tests.

In general, technics giving a positive reaction on a given case tended to do so at the same time. With the exception of the Eagle Wassermann, all the technics which were ever positive for a particular patient were positive simultaneously on at least one sample of

blood. The number of days from the first appearance of parasites to maximum positivity of the blood on the basis of all tests varied from 7 to 24 days, with an average of 15. In 6 cases this maximum positivity occurred after the last paroxysm, and in 3 after the start of quinine. In one patient the period was 11 days and in another 12 days after start of quinine.

An analysis of the titer of the Kahn Standard test shows that the occurrence of the maximum titer varied from 4 to 20 days after the first appearance of parasites, with a mean of 11 days. In Chart I the composite titer is plotted against time elapsed after the first appearance of parasites. This composite, which was obtained by adding all titers for all tests made in a particular period, counting negatives as zero and dividing by the number of tests made, reaches a peak of 22 in the second week after the appearance of parasites. The highest individual titer observed was 120. In 8 out of 11 cases studied, the highest titer appeared within 2 weeks after the first appearance of parasites, and in 10 cases in either the first or second positive reaction recorded.

Of 13 samples of blood withdrawn at the peaks of paroxysms, one titer of 120, one of 4, one of 3, two of 2, and eight of 0 were obtained. The titer of 120 was on blood withdrawn in the second week of fever.

There was no demonstrable correla-

TABLE 7

*Agreement Between Tests at Time Most Tests Were Positive*

Type of Test	Positive	Doubtful	Negative	Not Done
Eagle Wassermann	4	1	3	3
Eagle Microflocculation	3	2	3	3
Hinton	0	0	6	4
Kahn Standard (Kahn)	11	0	0	0
Kahn Standard (Mahoney)	10	0	0	1
Kline Diagnostic (Kline)	11	0	0	0
Kline Diagnostic (Mahoney)	7	1	1	2
Kolmer (Kolmer)	8	0	3	0
Kolmer (Mahoney)	9	0	0	2

tion between the parasite count and positivity of the blood. Six of the 11 cases attained maximum positivity on the basis of all tests after the last paroxysm and 3 after the start of quinine. One case attained maximum positivity 11 days, another 12 days after start of quinine.

Spinal fluid tests were performed on 3 patients while some of the blood tests were positive. All results were negative with the exception of a doubtful Kahn Standard and a 3+ Kahn presumptive as performed by Kahn on one specimen. The globulin and colloidal gold were negative and the protein 28. The Hinton, Kline Diagnostic (Kline), Kline Exclusion (Kline), Kolmer (Kolmer), and Kolmer (Mahoney) were negative on the same sample of fluid.

#### DISCUSSION

There can be little doubt that malaria does exert a pronounced influence upon the specificity of the complement-fixation and flocculation tests. In this series of 11 dementia praecox patients inoculated with malaria, all gave false positive reactions by at least two different techniques. The Hinton test was the only one which failed to give at least one positive reaction. This is difficult to understand in view of previous studies<sup>10, 1</sup> in which false positive reactions were obtained with the Hinton test in 11.1 and 4.4 per cent of patients with malaria.

Syphilis was excluded as a cause of the positive reactions in this study by the negative blood and spinal fluid serologic reactions, history, and physical examination before inoculation with malaria, and by the further fact that all patients became and remained seronegative after complete recovery from malaria. This is in contradiction to the claims of many previous authors who state where positive reactions were obtained in patients with malaria, there was concomitant syphilis. Their failure to detect this false positivity may have

been due to a variety of reasons, chief among which were probably low sensitivity of the serologic tests and failure to take an adequate number of specimens over a sufficiently long period of time. Certainly, the agreement of these findings with those of Kitchen and his associates presents strong evidence that malaria does produce a positive complement-fixation and flocculation reaction in patients who do not have syphilis.

The public health significance of this observation is self-evident. There is a large area in this country in which malaria is endemic. If we are to prevent erroneous diagnoses in asymptomatic syphilis in this area, the influence of malaria on serologic tests must be considered in each individual patient. The observation that the reaction may be positive several weeks after the cessation of clinical malaria adds to the problem. Certainly a serologic test for syphilis in a patient with active malaria, or one who has had malaria within a period of 4 weeks, should not be used as a basis for diagnosis in the absence of history and physical findings of syphilis. Rather, one should wait until at least 4 weeks have elapsed since the termination of the malaria, and then repeat the serologic test at least twice before using this as a basis for the diagnosis of asymptomatic syphilis without history.

#### SUMMARY

Of 11 apparently non-syphilitic dementia praecox patients inoculated with malaria, all cases had at least one positive reaction to the Kahn Standard (Kahn), the Kahn Standard (Mahoney), and the Kline Diagnostic (Kline). Out of 11 cases, positives were returned on 9 according to the Kline Diagnostic (Mahoney); 1 case returned three doubtfuls; and 1 case was never positive or doubtful. Out of 10 cases, the Kolmer Complement-Fixation test (Mahoney) was positive on 9, and the other patient had one doubtful reaction.

However, out of 11 cases, only 7 were positive to the Kolmer Complement-Fixation (Kolmer), and 4 cases were never positive. Five cases were positive out of 11 according to the Eagle Wassermann, and of the 6 that were never positive, 1 had a doubtful reaction. Only 4 patients out of 11 tested according to the Eagle microfloculation test were positive, and 1 of the other 7 had two doubtful reactions. However, this result of 4 patients positive out of 11 is statistically significant when it is known that all 11 were negative before inoculation. None of the 10 patients were positive to the Hinton test (Hinton), but 3 of them showed one doubtful reaction. No positives or doubtfuls were returned on any of the negative controls by any of these tests during this period. It may also be remarked that in those cases which were positive, the positive test was never an isolated one. Invariably another positive or doubtful reaction was returned on the same patient.

In none of these tests is there a single instance of a negative occurring between the first and last positives, and in only 1 case does a doubtful occur during this interval.

The greatest proportion of positive reactions occurred 15 to 21 days after the onset of clinical activity. With the exception of the Kahn Standard (Mahoney) and the Kolmer test (Mahoney) on the same patient, in no patient did the positivity to any test extend over a period longer than 4 weeks.

The duration of clinical activity, highest temperature reached, time of withdrawal of blood in relation to an individual paroxysm, or density of para-

sites, did not demonstrably influence the serologic reactivity of the blood. Although there was some variation between the results of different technics on the same sample of blood, in general, the results were consistent.

It is the opinion of the authors that, from the evidence presented, a diagnosis of asymptomatic syphilis based upon positive serology alone should not be made in an area where malaria is endemic without first eliminating the possibility of coincident malarial infection.

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# Complement-Fixation in Rickettsial Diseases\*

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THE complement-fixation reaction has been found useful in the study of a number of bacterial diseases and, more recently, in certain virus diseases including influenza, psittacosis, equine encephalomyelitis, lymphocytic choriomeningitis, lymphogranuloma venereum, papilloma, vaccinia, and others.

Complement-fixation in rickettsial diseases has been investigated by comparatively few workers. Among the early publications was that of Davis and Petersen,<sup>1</sup> 1911, who studied complement-fixation in Rocky Mountain spotted fever, using as antigens the serum and the macerated organs of infected guinea pigs and also infected tick eggs. Alcoholic extracts of organs from fatal cases of European typhus were used as antigens by several workers including Cathoire,<sup>2</sup> Müller,<sup>3</sup> Markl,<sup>4</sup> Delba,<sup>5</sup> and Papamarku.<sup>6</sup> Papamarku<sup>7</sup> later used an extract of infected lice as did Jacobthal<sup>8,9</sup> and Epstein.<sup>10</sup> None of these antigens yielded results which were very satisfactory. In all probability the number of rickettsiae in the infected organs was too small for the purpose of producing good antigen. Infected lice were unsuitable because

similar results were obtained with both normal and with infected lice.

With the newer improved methods for the cultivation of rickettsiae it has been possible to obtain much more satisfactory antigens. This is particularly true of endemic typhus and "Q" fevers. Endemic typhus fever rickettsiae grow abundantly in the infected chick yolk sac (Cox<sup>11</sup>) in the lungs of mice and rats infected by the intranasal route (Castaneda<sup>12</sup>), and also by the agar-tissue culture method of Zinsser, Fitzpatrick, and Wei.<sup>13</sup> The rickettsiae of "Q" fever can be obtained in considerable concentration in the spleens of infected mice (Burnet and Freeman<sup>14</sup>), and in the infected yolk sac of chick embryos. It is a more difficult problem to obtain luxuriant growth of the rickettsiae of Rocky Mountain spotted fever and European typhus.

Castaneda,<sup>15</sup> 1936, obtained positive complement-fixation reactions in cases of active and past infection with Mexican typhus and Brill's disease, using rickettsiae from x-rayed typhus infected rats as antigen.

One of us has recently reported on complement-fixation in "Q" fever<sup>16</sup> and in endemic typhus.<sup>17</sup> Mouse spleens and infected yolk sacs were the source of the rickettsiae used for antigens in "Q" fever and infected rats' lungs and infected yolk sac were employed for the typhus antigens.

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In the complement-fixation reaction as well as in other laboratory procedures used for determining active or past infection an important consideration is that of specificity, and the work here reported has been undertaken to obtain added information on this point, particularly in regard to endemic typhus fever and its differentiation from Rocky Mountain spotted fever. The Weil-Felix test has proved very useful in the differentiation of certain of the rickettsial diseases from other diseases, but it does not differentiate between typhus and spotted fever. The neutralization test in guinea pigs also fails at times to yield conclusive results, owing to secondary infections and nonspecific immunity (Badger<sup>18</sup>). The question of differentiation is of special importance in those sections of the country where both endemic typhus and Rocky Mountain spotted fever occur, as in the eastern and southeastern sections of the country (Dyer<sup>19</sup>).

*Materials*—The sera used in carrying on this study include: (1) sera from cases of past infection with either endemic typhus or Rocky Mountain spotted fever; (2) sera from active cases of endemic typhus or Rocky Mountain spotted fever; (3) sera from patients with other diseases.

The typhus antigens were prepared by grinding the yolk sacs of infected chick embryos in the 5th or 6th passage when they showed numerous rickettsiae, with sterile alundum, after draining to remove some of the yolk. A 10 per cent suspension in 0.85 per cent sterile saline with 1:10,000 merthiolate was prepared. This was centrifuged at low speed in the horizontal centrifuge in order to remove the larger particles. The supernatant fluid was then centrifuged for 1 hour at 4,000 r.p.m. The precipitate was suspended in 0.85 per cent saline containing merthiolate to the original volume. The precipitate which settled from this sus-

pension after standing 1 to 2 days was discarded. Further tissue precipitate settles on standing, but it has been found that this is not anticomplementary and the suspension may be shaken at the time of titration or for later use. The antigens were titrated to determine the lowest concentration at which fixation was obtained with a pooled specimen of known sera.

*Methods*—All of the specimens, both from the typhus and spotted fever cases, were tested against the endemic typhus antigen. Only a few tests were made with spotted fever antigens. The test was carried out as has previously been described, using 0.2 ml. amounts of inactivated sera in dilutions ranging from 1:2 to 1:256 or higher, 0.2 ml. amounts of antigen, and 0.2 ml. amounts of complement. After 1 hour's incubation, 0.4 ml. of sensitized sheep cells was added and incubation continued for another hour. After storage in the refrigerator over night readings were made the following morning. Fixation at 3+ or 4+ was considered a positive test.

## RESULTS

1. *Non-rickettsial diseases*—It might be expected that the complement-fixation test would be specific as far as non-rickettsial diseases are concerned. This was found to be true among those investigated. Included were 14 cases of tuberculosis, 10 cases of leprosy, 6 cases of malaria, 10 cases of syphilis, 10 cases of rheumatic fever, 13 cases of tularemia, 7 cases of undulant fever, 8 cases of typhoid fever, 8 cases of trachoma, 2 cases of lymphopathia venereum, 1 case of psittacosis, and 2 cases of amebiasis (Table 1). These sera were freshly drawn, with the exception of some of those from undulant fever, tularemia, and typhoid, which had been stored for periods of several weeks at icebox temperature. Slight fixation occurred in the lower dilutions in certain of the leprosy, undulant-fever, and tula-



TABLE 1  
*Complement-fixation in Non-rickettsial Diseases*

<i>No. of specimens</i>	<i>Disease</i>	<i>Complement-fixation</i>	<i>Remarks</i>
14	Tuberculosis	0	
10	Leprosy	0 to very slight	7 fixed complement in dilution 1:2 (1+ or 2+)
6	Malaria	0	2 cases active 2 cases cured 2 cases with tabes dorsalis
10	Syphilis	0	3 cases primary 3 cases secondary 4 cases tertiary
10	Rheumatic fever	0	
7	Undulant fever	0 to very slight	6 fixed complement in dilutions 1:2 to 1:4 (1+ or 2+). Titers against abortus antigen were 1:160 to 1:5120.
13	Tularemia	0 to very slight	7 fixed complement in dilutions 1:2 to 1:8 (1+ or 2+). Titers against tularensen antigen were 1:8 to 1:1280.
8	Typhoid fever	0	
8	Trachoma	0	2 cases papillary 1 case granular 1 case cicatricial
2	Lymphopathia venereum	0	
1	Psittacosis	0	
2	Amebiasis	0	

remia cases, but these were usually incomplete and not higher than 1:2 or 1:4 dilutions. All of the undulant fever cases were positive by agglutination in dilutions 1:160 to 1:5,120 against *Brucella* antigen, and the tularemia cases were positive against tularensen antigen in dilutions 1:8 to 1:1,280.

2. *Active and past endemic typhus infections*—The study of known typhus cases has been extended beyond that previously reported. The complement-fixation titers and the Weil-Felix titers of a series of specimens from a case of endemic typhus resulting from a laboratory infection have been determined (Figure 1). The complement-fixation titer increased from 1:8 on the 10th day to 1:4,096 on the 15th day, then fell to 1:2,048 on the 16th day. On the 85th day the titer was 1:1,024 and on the 180th day 1:512, thus showing a gradual decrease. The Weil-Felix titer ran approximately ten times as high as

the complement-fixation titer on the 15th or 16th day and fell off more rapidly, reaching 1:320 on the 85th day and 1:160 on the 180th day. A positive test by the Weil-Felix reaction was evident earlier than by complement-fixation, a titer of 1:80 being reached on the 6th day, 1:320 on the 9th day, and 1:1,280 on the 10th day.

In another case of typhus, originating as the result of a laboratory infection, the development of complement-fixing antibodies was much slower (Figure 2), a titer of 1:2 being reached on the 6th day, 1:4 on the 7th day, and 1:8 on the 14th day. The corresponding Weil-Felix titers were 1:320 to 1:5,120. This appears to have been an exceptional case. By 3 months the complement-fixation titer was 1:512 and the Weil-Felix titer 1:640.

Sera from 53 cases of past infection with endemic typhus were tested by the complement-fixation and Weil-Felix

COMPLEMENT FIXATION AND WEIL-FELIX TITERS  
OF SERUMS FROM A CASE OF ENDEMIC TYPHUS

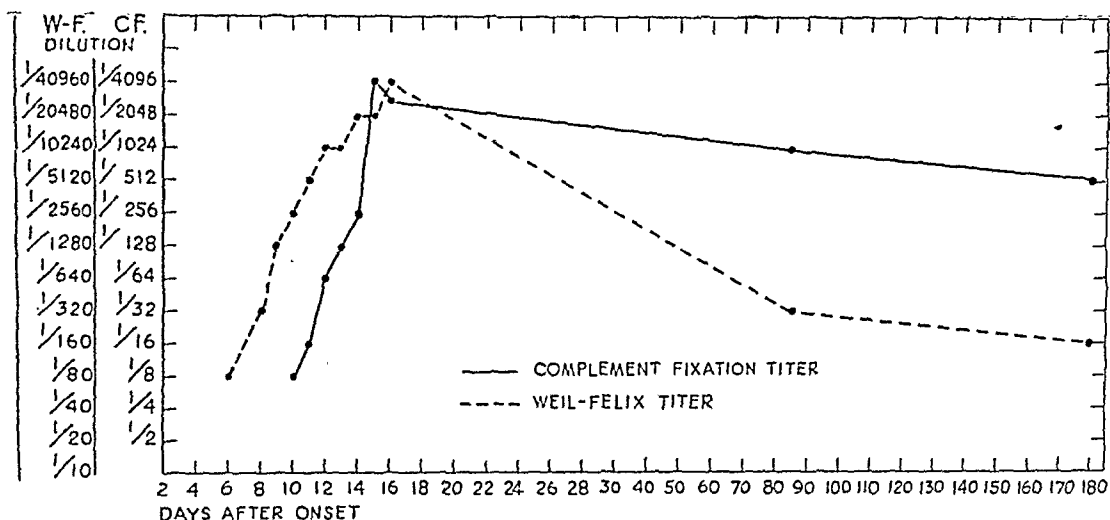


FIGURE 1

methods. All of these cases had occurred in Georgia and Alabama. The dates of occurrence varied from 2 months to 67 months prior to the time the sera were drawn. Fifteen cases were proved cases of endemic typhus, the virus having been isolated in guinea pigs. The diagnoses of the remaining 38 cases were based on clinical symptoms. It is possible that some of the cases which showed low titers may have been incorrectly diagnosed. It is significant, however, that the results of the tests agree so well with the diagnoses of the physicians, though it is to be considered that these cases occurred in a section of the country where the disease is endemic and therefore perhaps more likely to be correctly diagnosed.

The results obtained with these 53 cases are shown in Figure 3. The number of months elapsing between the date of onset and the date when the serum was obtained are represented by the abscissae and the complement-fixation and Weil-Felix titers by the ordinates. The graphs represent the average titers of all of the sera which were drawn at approximately the same length of time after onset of illness. It is very probable that the severity of the

infection, as well as the length of time elapsing since onset, influences the titer of the serum, hence the irregularities in the titers. The general trend of the graph representing the complement-fixation titers indicates a rather gradual decrease in this titer. If we assume that, at certain stages at least, the Weil-Felix titer is approximately ten times that of the complement-fixation titer, it is obvious that in general the Weil-Felix titers in these samples are much lower than the corresponding complement-fixation titers, though it is to be noted that all of these cases had occurred 2 months or more prior to the time the serum was obtained. Only one serum

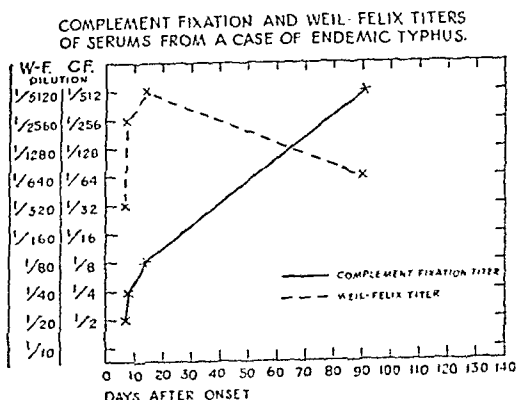


FIGURE 2

TABLE 2  
*Complement-fixation in Endemic Typhus*

Patient	Sex	Age	Race	Locality	Tick, flea or rat exposure	Symptoms	First appearance of rash	Physician's diagnosis	Date of onset	Serum collected	Weil-Felix fixation-titer (Typhus)	Complement-fixation-titer (Typhus)
1. WB	M	24	W	Ohio	Rats	Chill, fever, cough	Face and neck Dec. 10	Typhus	Dec. 6, 1940	8 months	1:80	1:256
2. PC	M	45	W	Md. D. C.	Rats	Chill, fever, aching, sweats	Body, Dec. 24	Typhus	Dec. 20, 1940	85 days	1:1280	1:128
3. EP	M	*	W	Ga.	Laboratory infection	Typical typhus symptoms. Severe case.	6th day	Typhus	Feb. 1, 1941	74 days	1:1280	1:1024
4. WG	M	*	W	Ga.	Laboratory infection	Typical typhus symptoms. Mild case.	6th day	Typhus	Feb. 1, 1941	74 days	1:40	1:512
5. AF	M	9	W	N. J.		Chill, fever	Feb. 25	Brill's disease	Feb. 20, 1941	31 days	1:2560	1:256
6. SW 6a. "	F	55	W	Mass. Fla.		Fever	Body	Typhus or RMSF	Mar. 12, 1941 16 "	13 days 16 "	1:1280 1:5120	1:128 1:128
7. AR	M	*	W	Mass. Fla.		Chill, fever, headache, sweats	Body, Mar. 24	Typhus or RMSF	Mar. 17, 1941	22 days	1:20480	1:4096
8. RF	M	*	W	N. Y.	Tick bite	Severe headache, semi-consciousness	Body, Mar. 26	Typhus or Brill's dis.	Mar. 20, 1941	16 days	1:2560	1:8192
9. EW	M	64	W	Cuba		Malaise, headache, fever	No skin manifestation	Typhus?	Aug. 8, 1941	9 days	1:2560	1:256
10. MC	F		W	Ga.		Chill, fever, headache	Body, June 1	Typhus	May 27, 1941	10 days	1:1280	1:256
11. LM 11a. "	M	31	W	N. C.		Fever, sweats, headache	Rash	Typhus	June 13, 1941 †	11 days 35 days	1:20480 1:5120	1:4096 1:8192
12. SC	M	20	W	Conn. Fla.	Rats	Fever, malaise, headache, sweats	Trunk and extremities, June 9-16	Brill's disease	June 5, 1941	June 18 approx.	1:20480	1:3192
13. JR	M	*	W	Ala.	Rats	Chill, fever, sweats headache	Body, June 29	Typhus	June 23, 1941	30 days (?)	1:2560	1:128
14. MS	F	35	W	Okl. Texas		Chill, fever, headache	Upper portions of extremities	Typhus or RMSF	July 9, 1941	15 days	1:1280	1:1024
15. WG	M	36	W	Va. D. C.	Rats	Fever, headache	None	Typhus	Aug. 26, 1941	20 days	1:10240	1:8192

\* Adults

† Estimated

COMPLEMENT FIXATION AND WEIL-FELIX TITERS OF SERUMS  
FROM 53 CASES OF PAST INFECTION WITH ENDEMIC TYPHUS.

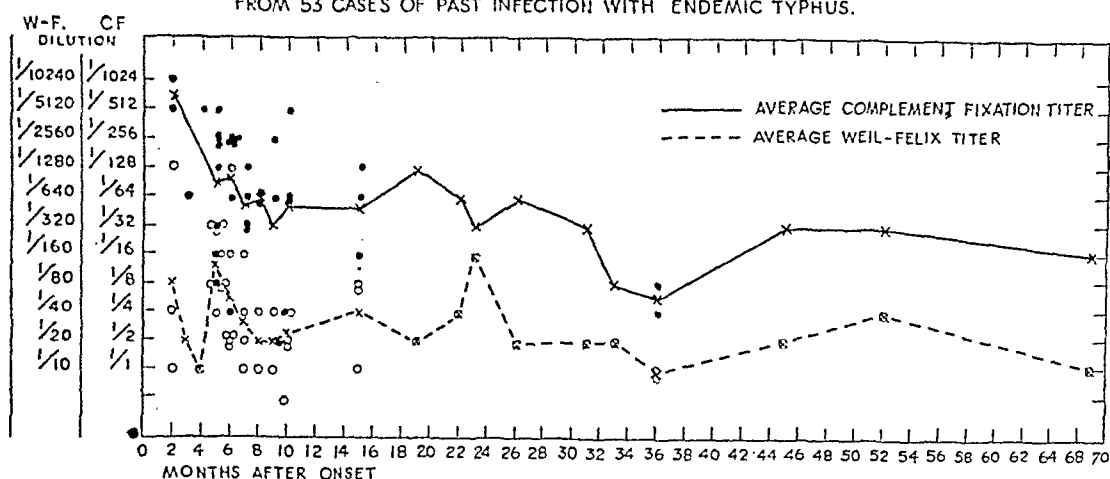


FIGURE 3

had a Weil-Felix titer higher than 1:320 in 6 months, and after this none was higher than 1:160, and the majority had titers of 1:80, 1:40, or lower. The complement-fixation titers with a few exceptions were 1:16 or higher even in one case which had occurred 5½ years previously. It is, therefore, evident that the complement-fixation titer of the serum is a much better criterion of past infection than is the Weil-Felix titer.

3. *Endemic typhus and Rocky Mountain spotted fevers*—The specificity of the complement-fixation test for endemic typhus has been further investigated by a comparative study of the results obtained with serum from active cases of endemic typhus and Rocky Mountain spotted fevers against a typhus antigen. A few cases of past infection are also included in this group. In the typhus group are 11 active 1941 cases and 4 cases of past infection. The Rocky Mountain spotted fever cases include 20 active 1941 cases and 10 cases of past infection, 2 of which occurred in 1939 and 8 in 1940. The sera from most of the active cases are those received at the National Institute of Health with requests for the Weil-Felix test, or for the complement-fixation test, or for tests to differentiate between

endemic typhus and Rocky Mountain spotted fever. A number of sera from cases of both endemic typhus and Rocky Mountain spotted fevers have been received from the branch Typhus Research Laboratory of the National Institute of Health at Savannah, Ga., and others from the Georgia State Health Department.

In order to evaluate the results of the tests, an effort has been made to obtain all the information necessary from the clinical standpoint for a diagnosis, using records from the hospitals or attending physicians. This information includes age and sex of patient, locality where the case occurred, date of onset of illness, history of tick or flea exposure, clinical symptoms, date of appearance, location and description of rash, the date when the specimen was obtained, and the physician's diagnosis.

Weil-Felix tests and complement-fixation tests were done on all specimens, using an endemic typhus antigen as previously stated in all the complement-fixation tests whether the sera were from cases diagnosed as endemic typhus or Rocky Mountain spotted fever. It was anticipated that positive results would be obtained in all the typhus cases and that probably negative

TABLE 3  
Complement-fixation in Rocky Mountain Spotted Fever  
(Typhus Antigen)

Patient	Sex	Age	Race	Local- ity	Tick, flea, or rat exposure	Symptoms	First appear- ance of rash	Physician's diagnosis	Date of onset	Serum collected	Weil-Felix titer	Complement- fixation titer	Remarks
1. GH	F	6	W	Md.		Fever, headache		RMSF	1939	2 years	1:10	0	
2. VH	F	13	W	Md.		Fever, headache		RMSF	1939	2 years	1:20	0	
3. GB	F	35	W	Ga.	Ticks	Chill, malaise, fever	Thighs, wrists June 5	RMSF	May 29, 1940	11 months	1:80	0	Confirmed by cross- immunity test*
4. HE	M	11	W	Md.	Ticks?	Fever, headache, nausea	Extremities May 14	RMSF	May 12, 1940	9 months	1:160	0	
5. LS	M	..	W	Ga.	Ticks	Chill, fever, head- ache, delirium	Legs, forearms July 6	RMSF	June 28, 1940	10 months	1:20	0	Confirmed by cross- immunity test*
6. MS	F	5	W	Ga.	Ticks	Fever, headache, delirium	Legs, forearms July 5	RMSF	June 28, 1940	10 months	1:20	0	Confirmed by cross- immunity test*
7. MB	F	9	W	Ga.	Ticks	Fever, headache	Extremities July 22	RMSF	July 14, 1940	10 months	1:10	0	Confirmed by cross- immunity test*
8. RV	M	..	W	Ga.	Ticks	Fever, headache, moderately severe	Chest and abdom- en July 17	RMSF	July 15, 1940	9 months	1:80	0	Confirmed by cross- immunity test*
9. MJB	F	10	W	Ga.	Ticks?	Fever, headache	Extremities July 30	RMSF	July 24, 1940	9 months	1:40	0	Confirmed by cross- immunity test*
10. EJ	M	5	W	Ga.		Fever, headache	Legs and fore- arms—Aug. 10	RMSF	Aug. 7, 1940	8 months	1:10	0	Confirmed by cross- immunity test*
11. LD	F	4	W	Md.	Ticks	Fever, labored respiration	Arms and legs	RMSF	Apr. 25, 1941	9 days	1:640	0	Fatal case
12. JR	M	10	W	Md.		Typical spotted fever	Extensive Apr. 28	RMSF	Apr. 23, 1941	13 days		1:16(2+)	Fatal case
13. MH													
13a. "	F	..	W	Ga.	Ticks	Fever	Extremities May 5	RMSF	May 6, 1941	5 days 7 days	0 0	0 0	
14. ER													
14a. "													
14b. "	M	..	W	Md.	Ticks	Fever, cough	Hands and feet	RMSF	May 15, 1941	6 days 12 " 58 "	1:1280 1:5120 1:80	0 0 0	
15. KT													
15a. "	F	3	C	Miss.	Ticks	Fever, headache, aching in body and legs	Arms and thighs May 30	RMSF or Typhus	May 29, 1941	14 days 54 "	1:20480 1:1280	1:256 0	

TABLE 3 (Cont.)  
Complement-fixation in Rocky Mountain Spotted Fever  
(Typhus Antigen)

Patient	Sex	Age	Race	Locality	Tick, flea, or rat exposure	Symptoms	First appearance of rash	Physician's diagnosis	Date of onset	Serum collected	Weil-Felix titer	Complement-fixation titer	Remarks
16. MM	F	5	W	Va.	Ticks	Chill, fever, aching	Extremities	RMSF	June 17, 1941	10 days	1:160	1:8	
Mrs. 17. AV	F	..	W	Ky.		Extremities	Extremities	Typhus or RMSF	June 1941	6-9-41	1:2560	0	
18. Mrs. 18a. JL	F	..	W	Conn.	Ticks?	Malaise, headache, fever	Body June 22	Typhus or RMSF	June 20, 1941 July 7,	1 day 18 days	1:10 1:20	0 0	
19. RH	F	36	W	Md.	Ticks?	Chill, fever, severe aching	Body July 1	RMSF or typhus	June 28, 1941	24 days	1:1280	1:32(2+)	
Mrs. 20. S	F	46	W	Ga.	Ticks	Chill, fever, nausea	Wrists and ankles	RMSF	June 30, 1941	8 days	1:320	1:8(2+)	
21. LS	F	42	W	Ga.	Ticks?	Chill, fever, headache	Over entire body—July 9	RMSF or typhus	July 7, 1941	16 days	1:2560	0	
22. DP	M	4	W	Ga.	Ticks	Typical symptoms of RMSF	Extremities	RMSF	July 11, 1941	10 days	1:80	0	
Mr. 23. P	M	35	W	Ga.	Ticks	Headache, fever, body pains	Extremities July 13	RMSF	July 12, 1941	5 days	0	1:4	
24. MB	F	28	W	Md.				RMSF	July 7-22-41	1:10240	1:32(2+)		
25. LR	F	69	W	Ky.	Ticks	Fever, sweats, delirium	Ankles	RMSF	July 13, 1941	11 days	1:160	0	Fatal case
26. DM	F	10	W	Pn.	Ticks	Fever, pain	Wrists and ankles	RMSF	July 20, 1941	24 days	1:1280	0	
27. OM	M	34	W	N. Y. Mont.	Ticks	Chill, fever, aching	No rash	RMSF	July 21, 1941	14 days	1:20	0	Had had course of vaccine
28. JS	M	28	W	Va.	Ticks	Fever, prostration	Characteristic rash, 4th day	RMSF	July 24	21 days	1:20	0	
29. WW													
29a. "	M	19	C	Ky.	Ticks	Fever, aching	Body Aug. 6	RMSF	Aug. 2, 1941	13 days 25 "	1:320 1:640	0 1:4	
30. NN	M	36	W	W. Va.		Chill, fever	Generalized rash, 1 week	RMSF or typhus	Aug. 6, 1941	7 days	1:40	0	

\* Immunity tests by Dr. George D. Brigham, Typhus Research Laboratory, Savannah, Ga.

results would be obtained in the spotted fever cases.

Considering the endemic typhus cases (Table 2), it was found that all of these gave positive results in comparatively high dilutions, none being lower than 1:128 and several as high as 1:4,096 and 1:8,192. Among the active cases, the shortest time recorded between the date of onset and the date of obtaining the serum was 9 days, and in this case the complement-fixation titer was 1:256. One of the highest titers recorded, 1:8,192, was on the 16th day. All of the results obtained in these tests were definite and clear-cut, and usually the titer dropped sharply from positive to negative. In those cases having a high complement-fixation titer the Weil-Felix titers were usually correspondingly high. Also in the 3 cases of past infection the results with the complement-fixation test were definite, the titers ranging from 1:256 to 1:1,024.

The majority of these cases were adults living in the eastern or south-eastern sections of the country and several gave a history of contact with

rats. The rash in most cases was typical of endemic typhus, occurring first on the body.

The 30 cases of Rocky Mountain spotted fever (Table 3) in contrast to the endemic typhus fever gave negative results for the most part in tests against endemic typhus antigen, though positive Weil-Felix agglutination titers were obtained in fairly high dilutions in a number of cases. All of the 10 cases of past infection which occurred from 8 months to 2 years prior to the test gave negative results in the complement-fixation test.

The active cases of Rocky Mountain spotted fever date from April 23, 1941. Eighteen specimens from 14 cases were all completely negative against endemic typhus antigen (Table 4).

The sera from 8 cases showed some cross-fixation with typhus antigen (Table 5). In probably none of the above cases was fixation present in a high enough titer to be considered significant, with the exception of the one case, K.T., in which complete fixation was obtained in the dilution of 1:256

TABLE 4  
*Complement-fixation in Rocky Mountain Spotted Fever  
(Typhus Antigen)  
No Cross-Fixation*

Case	Days after onset	Weil-Felix titer	Complement-fixation titer
11. LD	9	1:640	0
13. MH (1st specimen)	5	0	0
(2nd specimen)	7	0	0
14. FR (1st specimen)	6	1:1280	0
(2nd specimen)	12	1:5120	0
(3rd specimen)	58	1:80	0
15. KT (2nd specimen)	54	1:1280	0
17. Mrs. AV	..	1:2560	0
18. Mrs. JL (1st specimen)	1	1:10	0
(2nd specimen)	17	1:20	0
21. Mrs. LS	16	1:2560	0
22. DP	10	1:80	0
25. Mrs. LR	11	1:160	0
26. DM	24	1:1280	0
27. OM (2nd specimen)	14	1:20	0
28. JS	21	1:20	0
29. WW (1st specimen)	13	1:320	0
30. NN	7	1:40	0

TABLE 5  
Complement-fixation in Rocky Mountain Spotted Fever  
(Typhus Antigen)  
Cross-Fixation

Case	Days after onset	Weil-Felix titer	Complement-fixation Titer														
			1:2	1:4	1:8	1:16	1:32	1:64	1:128	1:256	1:512	1:1024	1:2048	1:4096	1:8192	1:16384	1:32768
12. JR	13	....	2	2	2	2	0	0									
15. KT	14	1:20480	4	4	4	4	4	4	4	4	3	2	0				
16. MM	20	1:160	4	3	2	0	0	0									
19. RH	24	1:1280	3	3	2	2	2	0									
20. Mrs. S	8	1:320	2	2	1	1	0	0									
23. MB	..	1:10240	3	2	2	2	2	1									
24. Mr. P	5	0	3	3	1	0	0	0									
29. WW	25	1:640	4	3	0	0	0	0									
Typhus Controls																	
15. WG	20	1:10240	4	4	4	4	4	4	4	4	4	4	4	4	4		
16. WD	..	1:320	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3

and partial in the 1:512 dilution. This case was a 3 year old child from whom ticks had been removed and who had had a rash typical of Rocky Mountain spotted fever. This specimen was taken on the 14th day, at which time the Weil-Felix titer was 1:20,480. A second specimen taken on the 54th day of illness was completely negative for typhus by the complement-fixation test, while it had a positive Weil-Felix in the 1:1,280 dilution. The high Weil-Felix titer may bear some relationship to the high cross-fixation titer or the possibility may be considered that this case may have suffered a previous typhus infection, since the locality was one in which endemic typhus prevails.

In repeated tests on the above specimens in which some cross-fixation occurred, it was found that fixation could be reduced by using a more dilute antigen, titration of the antigen being made against known typhus sera in order to insure that dilution was not carried past the point where positive results would be obtained. It was thus found possible to dilute some of the antigens as much as 1:32.

#### COMMENT

The question of the best method for the early diagnosis and the differentiation between typhus and Rocky Moun-

tain spotted fever is one which cannot be answered completely at the present time. The Weil-Felix test has proved very useful as a diagnostic test for certain rickettsial diseases without differentiating between them. The complement-fixation test for endemic typhus is positive in sufficiently high dilutions in general to exclude Rocky Mountain spotted fever. In some cases positive results were obtained in dilutions of 1:256 on the 9th or 10th day after onset. There may occasionally be some confusion between early cases of typhus or those of typhus in which complement-fixing antibodies develop slowly (see Figure 2), and cases of Rocky Mountain spotted fever which are more advanced or in which there is a rapid development of antibodies. However, this subject can be more adequately studied when studies similar to these reported are made with spotted fever antigens.

#### SUMMARY

The complement-fixation test for endemic typhus is of value in the detection of active or past infection. Titers of 1:128 and 1:256 may be reached on the 9th or 10th day of illness and 1:4,096 and 1:8,192 on the 14th or 15th day.

The complement-fixation reaction is a better criterion of past infection with endemic typhus than is the Weil-Felix



test as complement-fixing antibodies may be present in significant dilutions up to 5 or more years after the illness.

The complement-fixation test may probably be used to differentiate between endemic typhus and Rocky Mountain spotted fevers. Spotted fever sera tested against a typhus antigen as a rule give a negative reaction, while at the same time a positive Weil-Felix reaction may be obtained in quite high dilutions of serum. Occasionally there may be some cross-fixation of typhus antigen by spotted fever sera, but usually in low dilutions. Tests similar to those reported in which a spotted fever antigen is used may elucidate this phase of the problem.

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# Developing a Comprehensive Health Service in Puerto Rico\*

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GEOGRAPHICALLY Puerto Rico lies midway between the North and South American continents—a sentinel in the path of possible approaches of attack against the Western Hemisphere, but also a way station in the routes of peaceful communication, and a stepping stone to friendly relations between the Americas. Puerto Rico is, therefore, well fitted to become the meeting place of the peoples of this hemisphere for the furthering of common interests and the development of useful and highminded initiatives, especially in the field of public health administration and research.

Toward this end no enterprise could be more useful, no initiative more altruistic than the organization of technical and scientific work for the promotion and preservation of the public health. It is, therefore, with deep satisfaction and high hope that we have founded the Puerto Rico Public Health Association, whose self-imposed task is "to promote the public health by bringing together in closer association persons professionally engaged or interested in public health, by furthering their scientific advancement, by helping to spread public health knowledge, by stimulating and promoting research in public health and hygiene, by aiding in the adoption of legislation in the interest of public

health, and by volunteering assistance in times of stress or need."

The new association will not only thus come as a very welcome aid to the labors of the Health Department, but will also contribute to a better understanding between our fellow workers from the two continents. The association will also help materially to increase our efficiency in the field of public health, with benefit not only for our own Insular people but also for the nation as a whole and the continent at large.

Effective, conscientious training is absolutely essential for the success of any public health program that aspires to be of more than momentary significance. This is the reason why the Insular Department has always striven to engage the services of well trained men and women. To achieve this end, several years ago the Health Department organized a training center for nurses, sanitarians, and laboratory technicians, where short courses lasting from 6 to 8 weeks were given. In addition, through the facilities generously extended to it by the Rockefeller Foundation, the department was able to select a number of physicians, public health nurses, and sanitary engineers to hold fellowships for the purpose of pursuing graduate studies in the United States. These persons, upon their return to Puerto Rico, were placed in key positions within the department.

\* Address at the inaugural meeting of the Puerto Rico Public Health Association, San Juan, P. I., September 23, 1941.

As a natural result of these efforts, a Department of Public Health was created a year ago at the School of Tropical Medicine, San Juan, in coöperation with the University of Puerto Rico, Columbia University, and the Insular Department of Health, for the graduate training of physicians, sanitarians, technicians, and nurses. The curriculum embraces an extensive program, lasting a year, and includes the usual special courses to meet the needs of the students. The Public Health Unit at Rio Piedras has been reorganized to function as a modern experimental unit and as a specialized center for public health practice in the field. At the beginning of this scholastic year the facilities for the training of our personnel have also been extended by inaugurating a one year course of study for social workers in the College of Education of the University of Puerto Rico.

In Puerto Rico a low standard of living, with illness and widespread suffering, results from the geographical limitations, with extremely high population density, limited natural resources, lack of major industries, a large amount of unemployment and low wages. Such conditions are aggravated by the presence of a number of endemic diseases, notably malaria and hookworm, which are widely prevalent in tropical and subtropical districts. However, a large part of the illness on the Island is susceptible to control measures if funds become available.

The present Commissioner of Health was appointed during the year 1933, and a program was formulated which contemplated an attack on the fundamental problems responsible for a high mortality and considerable disease prevalence. Among other things this program provided for the extension of public health units under full-time medical officers to cover the 76 municipalities, organization of services for tuberculous patients based on sound

epidemiological principles, an island-wide program for treatment of venereally infected persons, extensive measures in rural sanitation and malaria control, and adequate hospital facilities for the care of the underprivileged population on the Island.

The first public health unit had been organized in the town of Rio Piedras during the year 1926; in 1933 there were 32 municipalities with this type of service, and during 1938 the entire territory of the Island, consisting of 76 municipalities, was being served by local public health units. In continental United States, where these units began to be organized more than 25 years ago, there were recently only 15 states with the entire territory covered by full-time health service, and in South American countries, although these agencies are rapidly being organized, their establishment is only in an early stage.

As a part of the tuberculosis program, hospital beds for the isolation of indigent patients were increased by 1,000, and treatment centers for ambulatory patients are being operated in 20 districts. An average of 75,000 fluoroscopies and 40,000 x-ray examinations are performed annually by trained physicians in these centers as a part of the case finding program. Approximately 3,000 tuberculous patients are hospitalized and over 5,000 are given artificial pneumothorax every year, with the result that in approximately 50 per cent of such cases the sputum is converted from positive to negative, eliminating a large number of foci of infection from the community. As a consequence of this program the mortality from this disease has dropped from a rate of 337 per 100,000 population in 1933 to a rate of 258 during the year 1939, a decrease of 23 per cent.

According to studies made by the Insular Health Department, 10 per cent of the urban and 5 per cent of the rural population have a positive serology for

syphilis. With the extension to Puerto Rico of the benefits of the La Follette-Bulwinkle Act, together with an appropriation of the Insular Legislature, it has been possible to operate 35 dispensaries throughout the Island for the diagnosis and treatment of venereal disease patients. Approximately one-half million complement-fixation and flocculation tests for the diagnosis of syphilis were performed last year, and not less than 20,000 indigent persons received treatment for which they could not afford to pay.

The large majority of the inhabitants in the rural districts earn wages which are entirely inadequate to provide their families with food, shelter, and other elementary needs of civilized people. Because of this fact, approximately 50 per cent of the homes in rural communities have no sanitary facilities, the soil contamination contributing to the spread of hookworm and other filth-borne diseases. In coöperation with the Works Progress Administration, the Insular Health Department is carrying out a project to provide rural homes of indigent persons with sanitary privies. During a period of approximately two years, 24,000 such privies have been constructed in 18 factories and distributed to indigent persons.

With 90 per cent of the families of this Island receiving an income of less than \$500 per year per family, medical care to the underprivileged has to be a responsibility of the government. Up to 1938 such care was provided in municipal hospitals which lacked the necessary equipment and trained personnel required by modern medical standards. Because of this fact, a program has been formulated for the centralization of such services in the Insular Government and provision has been made for seven large district hospitals with a capacity of 300 beds each, including services of surgery, medicine, obstetrics, and pediatrics. Four of these

hospitals have already been constructed, three of which have been adequately equipped and are in full operation. Equipment for the fourth hospital is being purchased at the present time and it will begin to function in the near future.

With the extension to the Island of the benefits of Titles V and VI of the Social Security Act, funds became available for the expansion of the public health program. Additional prenatal and infant hygiene clinics were opened in several municipalities, providing added facilities greatly needed for the care of infants and expectant mothers; part-time dentists were added to the staff of local health units in ten municipalities; two mobile dental units were purchased which are being used in rural districts; orthopedic care is being provided to the crippled; a nutrition program is being developed and additional public health nurses, social workers, laboratory technicians, and sanitarians have been employed to expand the scope of the local health unit program.

In connection with national defense numerous activities are being developed by the Insular Health Department to protect the armed forces stationed on the Island. A large part of the physical examinations carried out among the draftees were performed by members of the Health Department staff; blood tests have been made among 20,248 selectees, and those that showed a positive serology are receiving adequate treatment in the clinics in order to restore them to the service in the army; a total of 9,805 x-ray films of the chest have been taken among men who passed the physical examination for army duty in the local boards of the Selective Service, in order to eliminate the physically unfit, and malaria control work is being carried out intensively in the neighborhood of army camps to protect the health of the armed forces.

Because of its geographical location,

its vast culture acquired during past centuries, the bilingual advantages of its people as well as its political and scientific connections with the United States, Puerto Rico is especially well suited to act as an aid to continental solidarity and to serve as a meeting ground for inter-American conferences. To this end the first Inter-American Institute for Hospital Administrators was held in San Juan during the period December 1-13, 1940, under the auspices of the American College of Hospital Administrators and the American Hospital Association, and in coöperation with the University of Puerto Rico, the Insular Department of Health, the Puerto Rico Medical Association, the School of Tropical Medicine, the Territorial Charities Board, and the Puerto Rico Hospital Council. Distinguished visitors from the continent as well as

representatives from seven South and Central American republics participated in the conference.

I am confident that the foundation of a public health association in Puerto Rico will be a useful step in achieving high professional levels. It also will contribute to a higher standard of work and to make the particular health problems of the Island better known and better understood in the continental United States.

Healthy citizens are the foundation of a strong nation. In the present national emergency the Puerto Rico Department of Health will use every means available to improve the stamina of the people, adding its efforts to the national program and coöperating in the task of making the nation a stronger and healthier champion of democratic institutions.

## Field Study of the Prophylactic Value of Pertussis Vaccine\*

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A CONTROLLED study of the prophylactic value of Phase I pertussis vaccine was conducted in Binghamton, N. Y., from January 1, 1939, to November 1, 1940. The vaccine was prepared in the same manner as that used by Pearl Kendrick and Grace Eldering in their Grand Rapids, Mich., study<sup>1</sup> and was furnished by the Michigan State Health Department Laboratories. Three subcutaneous injections of 2.0 ml., 3.0 ml., and 3.0 ml., respectively, or a total of 8.0 ml. (80 billion organisms) were given at weekly intervals to children eligible for the study. Children from 6 months through 4 years of age attending the Binghamton City's well baby clinics were considered eligible if they had no history of pertussis or pertussis immunization.

In connection with another investigation conducted at the same time, each eligible child was given a hemolytic streptococcus toxin skin test, and every other child was given the pertussis vac-

cine as well. The children receiving only the skin test were kept as controls. The vaccinated children were entered in the study on the date of the last injection, while each control child was entered 2 weeks from the date of the skin test, so as to be entered at the same time as the corresponding vaccinated child. When there was more than one eligible child in a family, the practice of vaccinating the younger child was alternated with that of vaccinating the older child, to equalize the age distribution in the control and vaccinated groups. Only occasionally was it found impossible to follow this schedule, since the mothers were in the habit of accepting without question the recommendations of the woman pediatrician in charge, who had served in this capacity for many years.

Reactions to the vaccine were negligible.\*

Five hundred and ninety-three children were given the complete series of injections. Excluding 6 who moved out of town immediately after the last

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\* The sole reaction which might be classified as severe occurred in a 22 months old boy who developed convulsions and fever following the first injection. No further inoculations were given. This child's history indicated a proneness toward convulsions following relatively slight stimuli.

TABLE 1  
*Prophylactic Pertussis Vaccine Study*  
*Binghamton, N. Y.*

*Person Months of Observation of Vaccinated and Control Children*

<i>Year and Month</i> 1939	<i>Person Months of Observation</i>		<i>Year and Month</i> 1940	<i>Person Months of Observation</i>	
	<i>Vaccinated</i>	<i>Controls</i>		<i>Vaccinated</i>	<i>Controls</i>
Jan.	26	10	Jan.	530	505
Feb.	115	75	Feb.	524	504
Mar.	212	166	Mar.	520	510
Apr.	263	221	Apr.	518	519
May	302	273	May	514	520
June	388	332	June	506	517
July	484	414	July	498	517
Aug.	534	476	Aug.	492	518
Sept.	551	490	Sept.	486	520
Oct.	546	498	Oct.	478	523
Nov.	540	506			
Dec.	536	508			
			Total person months	9,563	9,122
			Total person years	797	760

inoculation, 587 children formed the vaccinated group. The control group consisted of 699 children.

Table 1 shows the number of vaccinated and control children under observation during each month. It will be noted that in spite of plans there was a slight lag in the entering of controls compared with vaccinated children during the first 6 months, so that when all of the immunizations had been completed (August, 1939), the vaccinated group was furnishing a somewhat greater number of person months of observation than the control group. It was decided, therefore, to admit to the study as control children all infants in study families as they reached 6 months of age. As a result, it will be observed that although the person months of observation in the vaccinated group progressively declined from September, 1939, the person months of observation of the control group levelled off, and toward the last slightly increased. The table indicates, however, that the person months of observation for each group were approximately the same for each month throughout the entire period. Taking the study as a whole, there was a total of 9,563 person months of observation for the vaccinated group, and 9,122 for the control group; or in terms of person years,

797 for the vaccinated group, and 760 for the control group.

#### METHOD OF OBSERVING STUDY CHILDREN

Every study family was visited once a month by a nurse to determine the occurrence of any illness during the interval in any member of the household. Two, and later, three nurses devoted their entire time to this visiting of families. All the nurses were on the regular staff of the Division of Public Health Nursing of the State Department of Health, and had the status of either supervising nurse or communicable disease consultant. In addition to the routine monthly visits, a call was made immediately upon a report from the family that an illness had occurred in the home, or upon the receipt of a report by the City Health Department indicating that whooping cough had been diagnosed in a member of the study household.

Every illness considered at all suspicious of whooping cough was referred by the nurse to a physician for investigation. The physician for this purpose was one of the two regularly employed epidemiologists in the Division of Communicable Diseases in the State Health Department. Unavoidable changes in personnel during the study period, how-

TABLE 2  
*Prophylactic Pertussis Vaccine Study*  
 Binghamton, N. Y.  
 Study Children According to Economic Status of Household

Economic Status	Number of Children			Per Cent		
	Vaccinated	Controls	Total	Vaccinated	Controls	Total
Good	137	112	249	24.1	16.4	19.9
Fair	246	288	534	43.2	42.0	42.6
Poor	186	285	471	32.7	41.6	37.6
Not stated	18	14	32			
Total	587	699	1,286	100.0	100.0	100.0

TABLE 3  
*Prophylactic Pertussis Vaccine Study*  
 Binghamton, N. Y.  
 Study Children According to Size of Household \*

Number in Household	Number of Study Children		Per Cent	
	Vaccinated	Controls	Vaccinated	Controls
3	110	83	18.7	11.9
4	146	169	24.9	24.2
5	120	137	20.4	19.6
6	73	104	12.4	14.9
7	55	68	9.4	9.7
8	28	55	4.8	7.9
9	22	28	3.7	4.0
10+	33	55	5.6	7.9
Total	587	699	100.0	100.0

\* At time first study child in the household was entered in study.

TABLE 4  
*Prophylactic Pertussis Vaccine Study*  
 Binghamton, N. Y.  
 Residence of Children as of Entry in Study

Ward	Per Cent		Ward	Per Cent	
	Vaccinated	Controls		Vaccinated	Controls
1	18.9	18.5	9	0.3	0.6
2	6.6	6.3	10	5.5	5.2
3	1.5	2.1	11	12.4	14.0
4	2.6	1.9	12	8.7	7.2
5	9.5	9.6	13	4.1	3.6
6	15.7	13.0	Out of city	4.3	3.9
7	7.7	10.2			
8	2.2	4.1	Total	100.0	100.0

ever, resulted in four different epidemiologists serving in this capacity. In investigating a suspected case of pertussis, the epidemiologist recorded the presence or absence of the characteristic whoop; presence and severity of paroxysms, vomiting, cyanosis and weight loss; laboratory findings; final opinion as to whether it was a definite case, suspicious case, or apparently not a case; and if considered to be a case, whether it was considered mild, moderately severe, or severe. The source cases

in all alleged exposures were similarly investigated by the epidemiologist. White blood counts and cough plates\* were used in diagnosis of cases, but both were found to be of relatively little assistance.

The epidemiologists were unaware as to which children had been vaccinated and which ones were controls, and ac-

\* Of 28 cough plates from vaccinated children with suspected pertussis, none was positive. Of 65 plates from control children with suspected pertussis, 15 were positive.



cidentally learned of the status of a child in only the occasional instance.

#### COMPARABILITY OF THE VACCINATED AND CONTROL GROUPS

A study of the classification of the vaccinated and control children according to economic status of the family, as estimated by the nurse, reveals that the vaccinated group had a somewhat greater percentage of children from homes of good economic status (Table 2). This slight disproportion is similarly indicated in an analysis of the two groups by the number of individuals per household (Table 3). A somewhat larger percentage of the children in the vaccinated group came from households of only three members and, conversely, a somewhat larger percentage of control children came from households with eight or more individuals.

In all other respects, the two groups seem to be entirely comparable, so far as one may judge by the various criteria available for comparison. From Table 4 it is obvious that the two groups were evenly distributed geographically throughout the City of Binghamton, and Table 5 indicates that the two groups are comparable from the standpoints of age, sex, previous history of tonsillectomy, measles, and of scarlet

TABLE 5  
*Prophylactic Pertussis Vaccine Study*  
*Binghamton, N. Y.*  
*Study Children According to Comparability of*  
*Vaccinated and Control Children*

<i>Criterion of Comparability</i>	<i>Vaccinated</i>	<i>Controls</i>
Average age in months *	25.1	24.6
Per cent males	50.6	54.9
Per cent with history of tonsillectomy *	4.5	3.9
Per cent with history of measles *	13.6	16.5
Per cent with history of scarlet fever *	1.2	1.6
Coughs ‡ per child (annual average) †	1.2	1.2
Other respiratory illnesses per child (annual average) †	1.9	1.8
Per cent having change of address †	38.8	40.5
Average monthly interval between nursing visits	1.1	1.1

\* As of entry in study

† During period of observation

‡ Exclusive of pertussis, and coughs preceded by pertussis exposure

fever; incidence during the study period of coughs due to colds, and of other respiratory illnesses considered as a group; per cent having change of address during the investigation; and the average interval between nursing visits. The coughs, it will be noted, are not only exclusive of pertussis, but of coughs preceded by exposure to pertussis. These latter coughs will be considered in detail later.

#### PERTUSSIS ATTACK RATES IN CONTROL AND VACCINATED GROUPS

In order to be as objective as possible

TABLE 6  
*Prophylactic Pertussis Vaccine Study*  
*Binghamton, N. Y.*  
*Objective Diagnostic Criteria*

<i>Duration of Cough</i>	<i>Characteristic Whoop</i>	<i>Positive Cough Plate</i>	<i>Paroxysms</i>	<i>Vomiting *</i>	<i>Classification</i>
14 days or more	+	..	..	..	Definite
" " " "	..	+	..	..	"
" " " "	..	..	+	+	"
" " " "	..	..	+	—	Suspicious
" " " "	..	..	—	+	"
" " " "	..	..	—	—	Possibly subclinical Pertussis †
Less than 14 days	..	..	+	+	Suspicious
" " " "	..	..	+	—	Possibly subclinical pertussis †
" " " "	..	..	—	+	" " "
" " " "	..	..	—	—	" " "

\* Vomiting had to occur more than once to be counted at all.

† So classified only if there is a history of exposure to a definite or suspicious pertussis case within 35 days of onset in this source case and the onset of cough in the exposed child occurred not earlier than 5 days from first exposure, nor later than 21 days subsequent to the last exposure.

in the decision as to whether or not a given illness was whooping cough, the evaluation was based upon the individual symptoms and findings indicated on the case history sheet, rather than merely upon the opinion expressed by the epidemiologist. Arbitrary criteria were established for determining whether or not a given case was to be considered whooping cough. These criteria are presented in Table 6. It will be noted that a definite diagnosis of pertussis was made if the child's cough lasted for 14 days or more and there was a history of a characteristic whoop or if a positive cough plate was secured. In no instance was a history of a characteristic whoop or a positive cough plate secured from a child with a cough of less than 14 days' duration. In addition, a case was considered definitely whooping cough if the child had a cough with a duration of 14 days or more, and suf-

The annual pertussis attack rates per 100 children based on these arbitrary criteria, are found in Table 7. Among the control children there occurred 101 definite and 24 suspicious cases of whooping cough, while among the vaccinated group there were only 42 definite and 19 suspicious cases. On the basis of definite cases alone, this results in an annual attack rate of 13.3 cases per 100 children among the control group, and a rate of 5.3 for the vaccinated group. The ratio of the rate among the control group to that among the vaccinated group is 2.5. When the suspicious cases are added, the rates become 16.4 among the vaccinated, and 7.7 among the controls, or a ratio in the rates of 2.1 to 1.

It will be recalled that there was some disproportion so far as economic status was concerned between the vaccinated and control groups. Although

TABLE 7  
*Prophylactic Pertussis Vaccine Study*  
*Binghamton, N. Y.*  
*Annual Pertussis Attack Rates Per 100 in Vaccinated and Control Children*

Status	Person Years	Number of Cases			Annual Pertussis Attack Rates Per 100	
		Definite	Suspicious	Definite and Suspicious	Definite	Definite and Suspicious
Vaccinated	797	42	19	61	5.3	7.7
Controls	760	101	24	125	13.3	16.4
Ratio control rate to vaccinated rate					2.5	2.1

fered both paroxysms and vomiting. Incidentally, vomiting following a coughing spell had to occur more than once to be counted at all.

A cough was classified "suspicious whooping cough" if its duration was 14 days or more and the child suffered either paroxysms or vomiting, but not both, or if a child had a cough of less than 14 days' duration and had both paroxysms and vomiting. Any cough less definite than this, but occurring after exposure to a definite or suspicious pertussis case, was noted and designated "possibly subclinical pertussis."

the attack rates were somewhat lower among those of good economic status (Table 8), and although there was a larger proportion of these children in the vaccinated group, this disparity is insufficient to account for the lower rate among the vaccinated children. The ratios of 2.5 and 2.1 remain unchanged when the attack rates among the control and vaccinated groups are adjusted for economic status.

#### RELATIVE SEVERITY OF PERTUSSIS ATTACKS

As to the relative severity of the

TABLE 8  
*Prophylactic Pertussis Vaccine Study, Binghamton, N. Y.*  
*Annual Pertussis Attack Rates Per 100 by Economic Status*

Economic Status	Person Years	Annual Pertussis Attack Rates Per 100			
		Definite Cases Only		Definite and Suspicious Cases	
		Vaccinated	Controls	Vaccinated	Controls
Good	320	3.1	8.6	4.2	10.9
Fair	656	5.3	14.8	8.6	17.6
Poor	556	6.4	13.1	8.4	17.0
Not stated	25	....	....	....	....
Total	1,557	5.3	13.3	7.7	16.4
Ratio C/V			2.5		2.1

definite cases of pertussis which occurred in the control and vaccinated groups, arbitrary criteria were established for classification, again based upon the epidemiologist's indication of the severity of the individual symptoms, rather than upon his final opinion as to the severity of the case as a whole. The criteria adopted are presented in Table 9. Paroxysms and vomiting were each

TABLE 10  
*Prophylactic Pertussis Vaccine Study*  
*Binghamton, N. Y.*  
*Cases of Pertussis According to Severity of Attack*

Severity of Attack	Number of Cases		Per Cent of Total	
	Vaccinated	Controls	Vaccinated	Controls
Suspicious	19	24	78.7	54.4
Mild	29	44		
Moderate	10	37		
Severe	3	20	4.9	16.0
Total	61	125	100.0	100.0

TABLE 9  
*Prophylactic Pertussis Vaccine Study*  
*Binghamton, N. Y.*  
*Objective Criteria as to Severity of Pertussis*

Count:  
If paroxysms indicated as: mild, count 1  
  moderate, " 2  
  severe, " 3  
If vomiting indicated as: mild, count 1  
  moderate, " 2  
  severe, " 3  
If weight loss is indicated, count 2

Calculation:  
If the sum of above is: 3 or less, classify attack as mild,  
  4 or 5, " " as moderate  
  6 or more, " " " severe

Comment:  
If pneumonia developed within 21 days of onset the attack is classified as severe regardless of other criteria.  
Vomiting had to occur more than once to be counted at all.

given numerical values of 1 for mild, 2 for moderately severe, and 3 for severe. Loss of weight was given a value of 2. Upon adding the numbers in a given case, the attack was classified as mild if the sum was 3 or less; moderate, if the sum was 4 or 5; and severe, if the sum totaled 6 points or more. An exception was made if pneumonia de-

veloped within 21 days of onset; the attack was classified as severe under these circumstances regardless of other criteria. The necessity for applying this last rule occurred in only one instance.

The result of classifying the cases in accordance with these standards is presented in Table 10. It will be noted that 79 per cent of the cases among the vaccinated group were classified as suspicious or mild, in comparison with 54 per cent among the control group. Sixteen per cent of the cases in the vaccinated group were considered moderately severe, compared with 30 per cent among the controls. Only 3 cases in the vaccinated group were classified as severe, or 5 per cent, compared with 20 cases, or 16 per cent, among the cases in the control children.

The same data presented as annual attack rates per 100 children are indicated in Table 11. It will be noted that for each classification, the rate is higher in the control group than in the

TABLE 11

*Prophylactic Pertussis Vaccine Study  
Binghamton, N. Y.*

*Annual Pertussis Attack Rates Per 100  
According to Severity of Cases*

Severity of Attack	Annual Attack Rate Per 100		Ratio C/V
	Vaccinated	Controls	
Suspicious	2.4	3.2	1.3
Mild	3.6	5.8	1.6
Moderate	1.3	4.9	3.8
Severe	0.4	2.6	6.5
Total	7.7	16.4	2.1
Possibly subclinical pertussis *	4.9	3.6	0.7

\* That is, coughs following exposure to pertussis but so mild could not be classified as "suspicious." These rates are based upon 39 cases among the vaccinated group, and 27 cases among the control group.

vaccinated group, with a ratio of the control to vaccinated rates progressively increasing from the suspicious cases, with a ratio of 1.3, to the severe cases with a ratio of 6.5. To this table has been added the rates for "possibly subclinical pertussis." These coughs, as mentioned above, are those which did not meet the criteria for suspicious cases of pertussis, but which occurred within the incubation period of whooping cough following exposure to a definite or suspicious case. Coughs due to infection with *Hemophilus pertussis* which cannot be recognized by the ordinary diagnostic criteria undoubtedly occur, but would be expected more

frequently in the vaccinated group if the vaccine were of value, since some cases which ordinarily would be sufficiently severe to permit recognition might be thus modified into subclinical attacks. It will be noted in Table 11 that the attack rate for these cases of "possibly subclinical pertussis" is higher among the vaccinated group than in the control group, contrary to the other classifications in the table, and results in a ratio of 0.7. It will be recalled from Table 5 that coughs similar to these, except for the lack of a prior history of pertussis exposure, occurred with equal frequency in the two groups.

#### INCIDENCE FOLLOWING EXPOSURE

Analysis of the data may also be made upon the basis of history of exposure to pertussis and the percentage of cases of pertussis developing therefrom. Data on this basis are given in Table 12. It will be noted the exposures are separated into household exposure and extra-household exposure. For purposes of this analysis, a history of exposure was counted as such only if it was to a confirmed definite case within 21 days of onset in this source case, and with onset in the exposed child occurring not earlier than 5 days from first exposure nor later than 21 days subsequent to the last exposure. Only

TABLE 12

*Prophylactic Pertussis Vaccine Study  
Binghamton, N. Y.*

*Exposures to Pertussis During Observation Period and Cases Apparently Resulting Therefrom*

	In Own Household		Outside Own Household	
	Vaccinated	Controls	Vaccinated	Controls
Number of exposures *	44	46	98	103
Definite cases	14	33	8	36
Per cent exposures resulting in cases	31.8	71.7	8.2	35.0
Ratio control rate to vaccinated rate		2.3		4.3
Definite and suspicious cases	17	39	11	41
Per cent exposures resulting in cases	38.6	84.8	11.2	39.8
Ratio control rate to vaccinated rate		2.2		3.6

\* Only one exposure counted per child. If multiple exposures, the most intimate one occurring 5 to 21 days prior to onset was counted.

Child considered exposed only if diagnosis in source case was confirmed as definitely pertussis, and exposure took place during first 21 days of illness in source case.

one exposure was counted per child. If a child suffered more than one exposure, the one tabulated was determined from a priority list of possible combinations of exposures, which gave preference to the more intimate exposure, and one resulting in illness and the more definite attack.

Considering first only the household exposures, it will be noted that 44 such exposures were observed among the vaccinated group and 46 among the control children. The exposures in the vaccinated group resulted in 14 definite cases, or 32 per cent. In contrast, household exposures among the control group resulted in 33 cases, or 72 per cent. If suspicious cases are included, the percentages become 39 and 85, respectively, for the vaccinated and control groups. The 85 per cent in the control group agrees well with numerous other studies showing the percentage of susceptible children developing pertussis upon household exposure. Considering extra-household exposure, again the numbers of histories of such exposure are very similar in the two groups; 98 among the vaccinated group and 103 among the controls. These exposures in the vaccinated group resulted in only 8 cases, or 8 per cent, while those in the control group resulted in 36 cases, or 35 per cent. Adding the suspicious

cases, the percentages become 11 and 40, respectively. It will be noted that the ratio of the per cent in the control group to that in the vaccinated group is distinctly higher with regard to extra-household exposure than with reference to household exposure (4.3 and 2.3, respectively, for definite cases, or 3.6 and 2.2, respectively, for definite and suspicious cases combined). If the vaccine is of value this might be expected, since it might produce sufficient immunity to protect against a transitory extra-household exposure but not enough to protect against the more intense household exposure.

#### HOUSEHOLD SECONDARY ATTACK RATES

A third method of analysis is on the basis of household secondary attack rates (Table 13). The numbers are very small in this study, but consistently in each age group there is a higher secondary attack rate among the control group, compared with the vaccinated group. Taking all ages, these rates are 34 per cent among vaccinated children, compared with 79 per cent among controls.

#### COMPARISON WITH OTHER STUDIES

This study was conceived and instituted when the Grand Rapids<sup>1</sup> and Cleveland<sup>2</sup> studies were the most impor-

TABLE 13  
*Prophylactic Pertussis Vaccine Study*  
*Binghamton, N. Y.*

*Household Secondary Attack Rates Among Vaccinated and Control Children by Age Groups*

Age at Time of Exposure	Vaccinated		Controls		Secondary Attack Rate Per 100	
	Number Exposed	Number Secondary Cases *	Number Exposed	Number Secondary Cases *	Vaccinated	Controls
Under 1 year	4	1	8	6	25.0	75.0
1 year	20	6	13	9	30.0	69.2
2	10	5	9	8	50.0	88.9
3	9	2	10	9	22.2	90.0
4	7	4	15	12	57.1	80.0
5	3	..	3	2	....	66.7
Total	53	18	58	46	34.0	79.3

\* Definite and suspicious cases exposed to a definite or suspicious case in the household within 5 weeks of onset in the source case, and onset in the exposed child not earlier than 5 days from first exposure, nor later than 21 days subsequent to the last exposure.

tant large, well controlled field studies published on this problem of the prophylactic value of pertussis vaccine. It was instituted, in fact, to attempt to clarify the conflicting findings in these

cine had been washed once with saline. The dosage in the Cleveland and Binghamton studies was the same, while in the Grand Rapids study, 4 instead of 3 weekly injections were given with a

TABLE 14  
*Prophylactic Pertussis Vaccine Study*  
*Binghamton, N. Y.*  
*Comparison of Cleveland, Grand Rapids, and Binghamton Studies*  
*(On Basis of Attack Rates)*

	Vaccinated Children			Control Children		
	Cleveland	Grand Rapids	Binghamton	Cleveland	Grand Rapids	Binghamton
No. of children	479	1,815	587	496	2,397	699
Person years	1,109 *	2,268	797	1,069 *	2,307	760
Pertussis cases	70	52	42 †	83	348	101 †
Annual attack rate per 100	6.3 *	2.3	5.3	7.8 *	15.1	13.3

\* Data furnished by Dr. Doull

† Definite and suspicious cases

TABLE 15  
*Prophylactic Pertussis Vaccine Study*  
*Binghamton, N. Y.*  
*Comparison of Cleveland, Grand Rapids, and Binghamton Studies*  
*(On Basis of Household Exposures)*

	Vaccinated Children			Control Children		
	Cleveland	Grand Rapids	Binghamton	Cleveland	Grand Rapids	Binghamton
No. of exposures	73	83	44	62	160	46
Cases resulting	56	29	17 *	61	143	39 *
Per cent	76.7	34.9	38.6	98.4	89.4	84.8

\* Definite and suspicious cases

two investigations. A comparison of the results in this study with those in the Grand Rapids and Cleveland studies, is presented, therefore, in Tables 14 and 15.

It should be kept in mind that there are certain differences in the manner in which these three studies were conducted. The more important of these relate to the preparation of the vaccine, dosage, and children used in the study. The Grand Rapids and Binghamton vaccines were supposedly identical and both prepared in the Michigan State Health Department Laboratories. The Cleveland vaccine was also a Phase I vaccine containing 10 billion organisms per ml., but in its preparation the organisms had been washed once with distilled water, while the Michigan vac-

total dose of 7 ml. instead of the 8 ml. in the other two studies. In the Cleveland study only children between the ages of 6 and 15 months were used, and there was the further stipulation that there had to be an older susceptible child of school age in the family. In the Binghamton study children 6 months through 4 years of age were used, and in the Grand Rapids investigation the children were between the ages of 8 months and 6 years. In neither of the latter studies was it required that there be a susceptible child of school age in the household.

Table 14 is on the basis of cases per 100 person years of observation, and shows that the Binghamton results are somewhat inferior to the Grand Rapids results, but that in both of these studies

there is a significant difference in the pertussis attack rates in the control and vaccinated children, in contrast with the Cleveland study. Table 15 is on the basis of cases following household exposure, and shows the comparability of the Grand Rapids and Binghamton results in contrast with the Cleveland experience.

#### SUMMARY AND CONCLUSIONS

A field study of the prophylactic value of a Phase I pertussis vaccine, was conducted in Binghamton, N. Y., from January 1, 1939, to November 1, 1940. The study involved 587 vaccinated children and 699 control children, aged 6 months through 4 years. During the period of observation the pertussis attack rate was more than twice as high in the control group as in the vaccinated group, and the cases of pertussis which did occur among the vaccinated group were distinctly less

severe than those which occurred among the control children.

**ACKNOWLEDGEMENTS**—This study was made possible only by the generous and unselfish cooperation of so many individuals that it is impossible to give proper credit to them all. We are particularly grateful to the Michigan State Department of Health for furnishing the vaccine; to Drs. Pearl Kendrick and James A. Doull for their advice during the investigation; to Drs. Bascom Johnson, Jr., and Stafford M. Wheeler, who served during part of the study as epidemiologists; to Dr. C. J. Longstreet, Health Officer of the City of Binghamton, and Dr. Mary Ross, in charge of Binghamton's well baby clinics; to Morton Robins who helped in the statistical analyses; and to the local and state nurses and laboratory workers who helped in the investigation.

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# The Private Public Health Nursing Agency in the Defense Program\*

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FOR many years the program of the private public health nursing agency has gone on, practically unchallenged. It has had the strong support of leading citizens. Its program has remained the same. Major changes have been few. Recently, however, public funds for support of public health have become increasingly available, not only to expand service into areas hitherto unserved, but to expand the official agency program itself. In some localities consideration is being given to the possibility of the public agency taking on the bedside nursing service—the traditional province of the private group—in order that only one nurse will serve the family. The need of a private nursing agency as a separate entity is being seriously questioned in such places.

Coupled with this shift of program comes the demand for nurses by state and federal governments; and in some of our large cities such an apparent shortage of nurses has developed that many agencies and institutions are finding it decidedly difficult to staff their units. Most nurse administrators are noticing an increasing unrest among the members of their staffs—particularly in the private agency.

In the face of this situation it is well

that we ask ourselves what the function of the private agency is today. Does it have a real contribution to make to the defense program as well as to community health, which justifies its demands on the contributor—who in addition to facing greatly increased taxes is besieged on all sides for contributions to a multitude of worthy causes? Can it justify the employment of nurses when the demand for them is so great elsewhere?

In the past we have stated our functions as follows:

1. To supplement but not duplicate the service of the official agency, working under its leadership and planning with it on a community basis. In most communities this has meant chiefly a program of bedside care, with a varying amount of health supervision of individuals or families, selected usually from a morbidity service intake.

2. To use the service for field experience for students of public health nursing. Most large private agencies have considered the preparation of students as secondary only to their community service program.

3. To study and develop new methods and services, since private administration gives flexibility to the use of funds.

4. To develop a lay public that is educated, through active participation in the service, to an appreciation of the values of public health, so that it will work for the maintenance of community service adequate both in quality and quantity.

These functions are time-honored in theory, but actual practice has seldom measured up. Too frequently we of the

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private agencies have felt that official leadership was not of a quality which deserved our coöperation, and instead of working to improve it we have sought many times to take over activities it should perform. We have only ourselves to blame if in some communities today, as the public agency has come to be more financially secure the private agency is looked upon with suspicion, as of doubtful value; and the contributions which we see ourselves able to make are regarded without great enthusiasm.

In the light of the present situation, these functions of the private agency will be discussed separately.

#### THE SERVICE PROGRAM

For many years the National Organization for Public Health Nursing and the American Public Health Association have stated that in any one area there is usually need for only one public and one private public health nursing agency. The defense program would seem to demand from each of us stringent economy, and to require each community to make community self-evaluation and planning its first duty. Whether the initial request for this comes from the official or the nonofficial group is of far less importance than that the effort be sincerely made. When wise leadership and professional integrity are present and agency prerogatives submerged, relative values as to service needs are readily recognized, and the precedence of basic needs over "frills" is insisted upon. Luxury service will not be allowed to absorb nursing time even though income from well invested funds is available for that purpose, until all essential professional needs are met throughout the country. The first obligation of every private agency today in the defense program, therefore, is to promote such a community study and to insure a wise, economical use of nurse power.

Our second obligation arises out of

this. Having merged our private agencies, at least, into one administrative unit in each area, we have a tremendous need to study details of service itself; and, with the health department and all other groups concerned, to determine the order of importance of service needs and how they shall be met. Such joint planning on a community basis will in most areas show that many of the unmet needs arise from a lack of just this type of community planning and can be met much more adequately with the same staff if an inclusive, over-all plan is developed. For the visiting nurse service this will mean a review of its entire intake policy in the light of local morbidity and mortality statistics, and will in most communities show a need for at least three definite developments if the community is to be well nursed and nurse power conserved.

#### COÖRDINATION OF HOSPITAL AND HOME CARE

First is the need to tie hospital and home nursing care together into a co-ordinated unit through carefully worked out, written coöperative agreements, by which certain types of patients will be automatically referred to the visiting nurse service with medical orders for home follow-up. In New York City a plan has been developed under the leadership of the Department of Health, which calls at present for referral of clinic patients of the following types: antepartum patients, premature infants, and those in the neonatal period, rheumatic fever patients, and other children with cardiac conditions while convalescing at home. Other types will be included as our study progresses. Under this plan the visiting nurse service makes one visit to each patient reported and on that basis selects patients most in need of further care. Its health supervision load is drawn, therefore, not alone from its morbidity service but from those types of patients for which

local vital statistics show the greatest need for service.

Since in New York City the indigent sick secure medical care largely from the hospitals and clinics, no plan for selection can be made except as hospitals and their medical directors are brought into it actively. So long as the private agency serves only those who know how to ask for care, and does not go out after the patients who most need that care, it cannot claim to be administering its service as a public health agency. The amount of free work that the various visiting nurse services throughout the country can do differs considerably, but the need for constant reëxamination of intake policies so that the free work done will best meet public health needs is evident.

#### CARE FOR MIDDLE-INCOME GROUP

Second, a study of the community public health nursing program will in most instances show that the middle-income group of citizens sadly lacks nursing care when ill at home. Usually they neither need nor can they afford full-time nursing service. Frequently, however, these patients do not understand the use of the part-time pay service that the visiting nurse service has to offer, and an active promotion program is needed, at least in the larger cities. This involves a carefully worked out plan with both the hospitals—the semi-private and private services—and the organized nursing groups. In New York City, we have found a great need for home care following discharge from hospitals for the semi-private group who carry hospital insurance, and who are almost entirely unknown to social service. While these patients have met their hospital costs through insurance, their medical bills often mount to a disastrous sum, and the need for guidance in budgetary planning is frequently second only to actual nursing care needs.

At the Henry Street Visiting Nurse

Service the part-pay and full-pay service in the last year has increased 30 per cent and we are making great effort to give it wide publicity and adjust administratively to its demands, in various ways, such as extending service into the evening. As might have been expected, we are finding the need for intelligent nursing as great here as in some of the less privileged homes. Care must be taken to see that this service does not encroach on the free service, however. This necessitates clear thinking by the board of directors and a recognition of two separate divisions in the budget—that for free care limited by the contributions secured for free work, and that for paid care adjusted to the fees received. Service by nurses is generalized, but growth of each service, speaking from a budgetary standpoint, is governed by different factors.

#### SERVICE TO INDUSTRIES

Having seen to it that the intake policies are based on an intelligent community plan, statistically guided and economically administered, the private agencies in many sections of the country will in addition be needed to supplement official efforts in safeguarding the health of the industrial worker. It is expected that the department of health will study industrial health needs and supply an advisory personnel which will assist local industries in the development of health services. In industries having defense contracts pressure is already great, the incidence of accidents and illness is increasing, and employers are eager to do all that is possible to keep employees at work. Well qualified public health nurses are needed for such services and the private agency can make a real contribution by preparing and then freeing its own staff nurses for such work. In the case of small industries that cannot afford or do not need the full-time services of a nurse, the agency can consistently sell service

on an hourly basis at cost. A number of communities have already begun to offer such a program to industry and the sale of nursing service by visiting nurse associations is slowly growing.

In New York City, with the approval of the Health Commissioner, the Henry Street Visiting Nurse Service sells such service to the plant at cost, and its nurses are finding the opportunities for health instruction so real that they are grateful for the privilege thus afforded. In addition, requests from employers for contracts with the nursing agency to care for employees when sick at home are increasing rapidly, necessitating a real effort in our staff education program to strengthen the content of our adult health supervision visits. About one thousand such contracts, either direct or through group insurance, are in force at present in the Henry Street Service.

So, in this emergency, we still adhere to our first historical function—that of supplementing but not duplicating the official agency's program; taking pride in being a necessary part of the community plan; respected, we hope, by our coworkers because our sense of values is guided by a public health knowledge of community needs, and not by agency consciousness.

#### PROFESSIONAL EDUCATION PROGRAM

Although at all times the private agency has afforded valuable field experience for inexperienced public health nurses, perhaps there has never been so great a need to supply it to such large numbers of new workers as there is at present. When this summer the U. S. Public Health Service decided to employ over a hundred nurses, it was the private agencies who largely furnished this personnel—and rightly so. For over the country as a whole the public agencies have need of every experienced staff member if essential community services are to be maintained. If inexperienced

nurses must be employed immediately for replacement they can probably be assimilated more rapidly and effectively by the private group with its bedside program and long experience in training than by the average public agency. Moreover, if we as a group believe in public support for health work, we should care intensely that the highest possible civil service standards be maintained, and be ready to make any sacrifice necessary to assist in recruiting a well qualified personnel.

Since defense industries and extracantonment zones represent the most difficult types of pioneer services, we must plan to release experienced staff members. There is no place here for the poorly adjusted, inexperienced, restless nurse, and we have as definite a responsibility to keep her from applying as we have to urge the right type of nurse to go.

At the Henry Street Visiting Nurse Service, the Nursing Committee and Board of Directors recognized this and approved a plan involving the following steps:

1. A plan was to be developed to release the maximum possible number of experienced nurses for government service and still maintain a satisfactory quality of service locally. This involved a study with each staff member of her stage of development and a mutual recognition of her individual place in the plan. It was decided that those released to the government should have had at least 3 years of supervised experience, should have completed 1 year's study in public health nursing theory, and should be mature, well adjusted, dependable workers. It was considered equally important to select those who would remain in the organization to carry the service load and continue actively with their preparation, while assisting with the induction of our increased number of trainees. It was thought that a maximum turnover of 100 such nurses could be handled each year so long as the emergency exists, which just doubles the usual rate.

2. The plan next calls for enlargement of the recruiting and staff development program so that replacement with a basically sound

young group will be assured and the quality and quantity of community service be maintained.

3. Provision of additional funds is necessary so that the community service program can be kept stable. It was recognized that an inexperienced staff nurse during her first year of service with us is only about 80 per cent as effective as a nurse in her second and third years. Therefore, every 5 seasoned nurses who leave are to be replaced with 6 new ones, with supervisory and clerical service increased in proportion. Believing that this is a real contribution to the defense program—for no program is any stronger than the caliber of its staff—the Board of Directors voted to meet this increased cost from capital funds, if necessary. Such expenditures will be separated from current running expenses, and studied as to their effect on visit costs.

It was agreed that in so far as possible, staff would be released under this plan *only* for defense purposes and to those sections of the country which, through lack of professional personnel, are themselves unable to provide workers for their increased needs. This involves discouraging our staff from taking positions with certain types of agencies which are not carrying essential services, or from going to communities where there is no conscious effort to avoid duplication and to use economically the nurses already available locally. In the first few months of this plan we have released 22 on a leave of absence for defense work, and many others regard themselves as on call.

The success of such a plan, however, depends on the complete coöperation of the entire staff, so that each member settles down, recognizes her function in the agency as a teacher of the new group and a stabilizer of the service, and accepts the necessity for growing up in public health as rapidly as possible. If quality service is to be maintained locally it means a double responsibility for each supervisor, who sometimes has to be helped to see that her contribution to the national defense program will be as great if she remains to

assist in the training program as if she herself volunteers for the greener fields that are calling. Upon the administrative group devolves the difficult problem of keeping the group steady and of maintaining a sense of proportion. To speak realistically, however, we were faced early in 1941 with restlessness and an increased turnover anyway, and the plan described has been our answer to the question of whether we would try to guide this constructively, or have a turnover of inadequately prepared workers that upset our local service but contributed little to the total defense need. Only time can prove or disprove its wisdom.

In the discussion of any program of field experience it seems fitting to remind ourselves that the contribution which a private agency is able to make is directly related to the order which that agency has brought to its own house. For its value as an experience for new staff surely is small unless the nurses who work there see a community program functioning properly and the private agency's work effectively integrated into it. For too many years private agencies have emphasized in their training programs perfection of technic and routine methods of work, to the neglect of development of a worker who could plan for herself, possessing a sense of relative community and professional values as to what must come first in a crowded program. Too often the staff nurse saw expressed in the attitude of her administrative superiors a feeling that the official program, personnel, and performance were weak, and too seldom did she see in action a generous aggressiveness attempting to inculcate leadership where it rightfully belonged if it did not already exist there. Nurses do not learn coöperation and community planning by hearing it discussed in the classroom. Rather, they learn it by seeing it functioning in practice.

## STUDY OF NEW METHODS

With a shortage of experienced public health nurses and a conviction that nurse power must be conserved for nursing needs, we face today the urgent question of the place of other workers in our program—of the practical nurse, the nurse's aide, and the slightly trained volunteer. Where and how can they be used without jeopardy to the safety of the patient? Must every visit now made by a public health nurse be a public health visit? If not, at what spot must service be picked up again by the public health nurse? Certainly, there are no definite *types* of patients who can be turned over to the nonprofessional group—such as the chronic or the convalescent patient—for we know how conditions within each family change. Because our bedside care program lends itself to such experimentation, we have a challenge to try out new ways by which we can conserve our supply of professional nursing through every possible use of other workers.

This coming winter should see us actively engaged in such studies. We must admit at the outset that our standardized picture will be greatly changed and perhaps the cost of visit increased. For if some of the routine of the visits is removed from the nurse's day, will not the remaining visits be longer and will not the time required for making contacts with physicians, for referring to social agencies, and for record-writing increase? What of the cost of supervision? No one knows the answer at present, but no one will deny both the importance of the problem and its complexity, and the necessity that the answer found shall fit correctly into our total future plan for community nursing.

## EDUCATION OF THE LAY PUBLIC

In regard to our fourth historical function—that of educating a lay group to understand and support public health

programs—the present situation offers a good test of the success of our past efforts.

Because of the lay workers' control of the private agency through fund raising and actual administrative participation, we have always claimed that their opportunities to learn sound public health principles and practice were greater in the private agency than in the public agency. Today we public health nurses in private agencies can well ask ourselves what we have taught our lay committees and board members, and question how they are going to rise to the emergency that faces us. Can they pull their weight in this need for changing our pattern? Do they know and believe in good administrative practice so that in some instances they will even force our steps, when reluctant, into the paths of community coöperation? Here is our chance to learn whether we really prepared them for this broader field of community service and to evaluate our own philosophy in terms of their action.

## SUMMARY

So, we maintain that for each private agency, in each community, the first step in finding its place in the defense program consists in bringing about a community evaluation of the total public health nursing program, so that we conserve our supply of personnel and are able not only to provide for present needs but to maintain high professional standards as defense programs expand.

Never were we as a group faced with a greater challenge, and our success may in great part be evidenced by the degree to which the coming months bring an actual reduction in the number of private agencies through merging of community groups. Appraisal at a future date should show that, resulting from this movement, came a strengthening of programs because of an increase in funds released for community service

through a saving in administrative costs, as well as a freeing of personnel for expansion into areas sorely in need of the public health nurse. Unfortunately, there is much more to be done than there are qualified workers available to do it, and a sound administrative policy must be developed to make the best use of every member of our profession. To attain this in practice throughout the stretch of this country is the most important job of the private as well as the public agency at present. There is no need to change fundamental pro-

fessional principles. The need is to make practice, long reluctant, more consistent with these principles.

It is time that each of us pause and remember that we are first of all public health—not agency—workers, and that as a group we stand together, regardless of the type of our employment, firm in our belief in the contribution which our profession can make to human welfare, and convinced that teamwork is more highly prized as our tool than is any skill symbolized by the time honored black bag.

# Is There Need for the Fortification of Milk?\*

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IN discussing this question it is unnecessary to dwell upon the variation in the nutritive value of milk as affected by summer and winter feeding. That there is such variation to a demonstrable degree is well known, but present-day practice in the management of dairy herds is such that the health of the cows and the flow of milk throughout lactation is rather generally maintained at good standards. There is sufficient evidence that ordinary milk as sold in cities is of uniformly good nutritive quality. The numerous experiments on animals and the dietetic studies on children in which the merits of milk as a supplemental food were demonstrated were, with few exceptions, conducted with ordinary market milk. Such studies, together with the well known fact that in the feeding of infants and young children milk is quite indispensable, have fully justified the statement that milk is the one food for which there is no effective substitute.

## VALUE OF MILK IN THE DIET

With the exception of the bottle-fed infant, when milk diluted with water may for a brief period form the sole food, milk is never employed as the sole source of nutriment. The specific

contributions of milk are calcium in amounts not readily obtainable from other foods, enhancement of the biological value of the dietary proteins by reason of the high content of certain essential amino acids in milk proteins, and vitamin A and riboflavin in particular among the vitamins. Milk is the most important of the protective foods from the standpoint of improving the quality of the diets ordinarily selected by individuals in the Western Hemisphere.

The value of a generous quota of milk and other dairy products in the human diet is not so apparent in a country where people eat as wide a variety of good foods as is the custom with the majority of Americans whose economic status is satisfactory, as it is, for example, among the different racial groups of India, where lack of transportation, agricultural limitations due to soil and climate, taboos, religious principles and prejudices, have determined that large groups of people subsist upon simple and monotonous diets of very different qualities. The diets and the physical characteristics and health standards of several racial groups in India have been described by McCay, McCarrison, Aykroyd, and others. The basis of all of these diets is cereals, pulses, vegetables, fruits, and milk. Quantitatively the variation in the consumption of each of the classes of foods

\* Read before the Food and Nutrition Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 14, 1941.

of vegetable origin is great, and that of milk enormous. The poor Bengali who eats rice together with dahl (a legume seed), vegetables and oil, with a little fish, is of inferior physique. The same is true of the Madrassi, whose staple diet is rice, and who takes no food of animal origin. On the other hand, the Sikhs, the Mahratta, and the Pathan peoples are pastoral in their mode of life, and include very liberal amounts of dairy products in their diets. All of these peoples are described as of superior physical development.

The consumption of an adequate quota of milk products is imperative to make our type of diet fully adequate for the maintenance of a high standard of health. This point is especially in need of emphasis at present, when enthusiasts over fortification of foods are saying a great deal about the extent of malnutrition in the United States, and promoting the belief among the uninformed that our resources in foods presently available are not sufficient and that we need to improve various items in the dietary in order to safeguard health. The errors in eating habits of our time lie in the wrong selection of foods from among our available products. The causes are principally due to poverty or ignorance or indifference. There seem always to be some who do not want to be saved.

#### FORTIFICATION OF MILK WITH VITAMIN D

For many years health officials, with a view to safeguarding milk against the dangerous human contacts which may infect milk and bring about epidemics, urged the adoption of ordinances prohibiting the subtraction from or the addition of anything to market milk. This practice became general and was a great safeguard of consumers. The first relaxation of this standard of practice which occurred with the approval of organized medicine and other public

health officials was that of permitting the sale of market milk fortified with vitamin D. The advent of vitamin D milk was the result of very special conditions. After the announcement in 1922 of the discovery that there existed in certain fats and oils a vitamin which exerted an extraordinary influence on the maintenance of the normal phosphate ion content of the blood, facilitated to a remarkable degree the absorption and retention of calcium and phosphate ions, and regulated the calcification of growing bones—in other words, protected infants and children against rickets, then exceedingly common in temperate regions—the newly discovered nutrient designated vitamin D was enthusiastically proclaimed by the pediatricians. They recognized that here was a discovery of fundamental importance to the public health. Distinguished medical men at once recognized that this vitamin should be provided to all infants and children living under climatic conditions which contributed to the prevalence of rickets. It was agreed that a method for its distribution was desirable, which would insure that the largest possible number of infants and children would receive it in adequate amounts for prophylactic purposes without reliance upon a prescription by the physician or upon the solicitude of the parents to secure it through the drug store. It was generally agreed that milk was the food of choice to serve as the carrier of the vitamin. With few exceptions vitamin D milk has had the approval of health commissioners as well as of the medical profession, and it is apparent that it has come to stay. The prevention of rickets in children constitutes one of the great achievements in safeguarding the public health. It was, however, only because of the unique situation presented by the fact that vitamin D is indispensable to the protection of the health of an infant, and by the further fact that none of



our common foods contain the vitamin in sufficient amounts—facts which necessitate obtaining it from some source not readily available to the general public—that the rigid requirements of milk ordinances regarding additions to milk were relaxed.

#### SYNTHETIC VITAMINS

But we have recently seen astonishing development in certain of the food industries owing to the availability of low cost synthetic vitamins or concentrates made from natural products. During the past thirty years spectacular discovery followed spectacular discovery in nutritional research. Hitherto unsuspected nutrients were brought to light in rapid succession. Their absence, or their occurrence and relative abundance in each of the more common foods, was revealed by experimental studies. The nutritive needs of the body in quantitative terms as respects each of the known nutrients were studiously inquired into until we now have a most valuable body of knowledge concerning these matters. Experimental studies with many combinations of foods in different proportions revealed combinations which sustain optimum nutrition, and others which lead to impairment of the physiological status in different degrees. Such results were amazing to a generation of biochemists and physiologists who had been taught that a suitable mixture of protein, carbohydrate, and fat, together with a not well defined list of inorganic elements, would be sufficient to nourish a mammal satisfactorily during growth and throughout life. Pictures of animals suffering from specific malnutritional states dramatized the new discoveries and aroused the public interest. The deductions from animal experiments that certain human diseases which were widespread were due to dietary inadequacy—beriberi, scurvy, rickets, night-blindness, pellagra, etc.—aroused the greatest interest of both the medical

profession and the consuming public. The promise of better health through right eating was kept before the public, which became nutrition conscious to a hitherto unprecedented degree.

Discovery of the dietary properties of individual foods inevitably placed some in more, and others in less favorable positions as respects their contribution of essential nutrients to the diet. Inevitably those who sold foods for which nutritional research had facts pertinent to good sales talk played up the merits of their products in every way possible. It was good business. Those who dealt in products which science said were among the more deficient foods in essential nutrients were in low spirits, believing that their industry was being hurt, and that worse was yet to come. Time, however, brought other surprises which changed their mood to hopefulness and expectation.

As soon as a new vitamin was discovered, efforts were made to isolate it in a pure state. This accomplished, attention was turned to increasing the yield of an isolated vitamin from natural products. Soon enough of it was available for the organic chemists to apply their technic for discovering the structure of its molecule, and soon thereafter for synthesizing it. Within the past few years certain vitamins have been manufactured on a large scale and their cost has been greatly reduced. There are two great fields open for the exploitation of synthetic vitamins—through the drug trade and through their addition to foods. Both of these outlets are being vigorously promoted. Retail drug trade in vitamin preparations has now reached the proportions of big business. In the September 15, 1941, issue of *Barron's*, the national financial weekly, the following statement appeared:

Meanwhile, that busy group of companies engaged in selling vitamins to the trade, is continuing to expand sales of its product. Ten years ago, retail sales totaled around

2 million dollars a year. In 1939, the last year for which figures are obtainable, retail sales in drug stores reached 100 million dollars. Currently, they are believed to be much higher.

It appears that almost every one interested in the sale of a food which is deficient in one or more nutrients has day-dreamed about adding the missing substance with a view to increasing the sales appeal. Until quite recently they were all deterred by the high cost of synthetic vitamins and concentrates, but they are no longer too costly to warrant testing out the industrial possibilities of their addition to foods. Accordingly we are witnessing the adoption of restoration of vitamins and minerals removed in the milling of cereal products, the so-called "enrichment" of flour, and the fortification of fats and oils used in the manufacture of butter substitutes with vitamins A and D. There is some discussion of the vitaminization of sugar.

These more or less general statements about foods and nutrition were intended to be prefatory to more specific discussion of the problem of fortification of milk. They seem justified because they illustrate the movement toward "improving" deficient foods.

#### FORTIFICATION OF MILK

Milk is low in iron, copper, manganese, and rapidly loses its content of ascorbic acid after it leaves the cow, and contains very little of it when pasteurized. It is not, therefore, a complete food when it serves as the sole source of nutriment over a considerable period. Many inquiries have been made concerning the proposed advantages of fortifying milk in various ways such as "mineralized milk," "vitamin C milk," or milk fortified with several vitamins and inorganic elements. It has been proposed to add carotene to milk to make winter milk of the same color as that obtained from cows on green pas-

ture, and at the same time increase its potential vitamin A value. It is evident that some distributors have supposed that there may be enough sales appeal, and increased nutritive value in such so-called "improved" milk to warrant putting it on the market. At present in one city there is being distributed a milk fortified with five vitamins and certain mineral elements, and with the approval of the health department.

If we accept the view that it is easily possible to plan fully adequate diets using only natural foods, it would seem that we should do well to rely on these rather than to encourage separation of the components of cereals and then partially restore the essential nutrients removed in refining. It would also seem to be a safe conclusion that, all things considered, the fortification of vegetable fats and oils to bring them into competition with milk fats, whether in the form of fluid milk, cream, butter, or cheese, is of doubtful expediency. This is especially true from the standpoint of the farmer who produces milk. There are many vegetable foods which are so rich in carotene that when dairy products are included in the diet in amounts sufficient to supplement it in other respects, it is easy to raise the provitamin A intake to a generous allowance without making use of fortified fats in human diets. Carrots and tomatoes are examples of rich sources of carotene.

Valid reasons for discouraging the enrichment or fortification of foods with vitamins or minerals or both are, first the item of cost, and second the complications which will arise in the planning of dietaries when restored or fortified products are purchased along with natural foods. It is uneconomical to take foods apart and then recombine certain components, and it is an economic waste to include in the daily menus more than the actual requirements of any vitamin or mineral, except

under conditions when the body stores have become depleted.

The common sense view seems to warrant the conclusion that it is unwise to permit fortification of milk other than with vitamin D. It is unnecessary in the interest of the consumer and undesirable from the standpoint of the distributor. The sales value of a line of special milks, mineralized or vitaminized, is still undetermined, but it would appear that if such products are purchased by those who are adhering to wisely planned diets they will be buying something that they do not need and so spending extra money to no good purpose. It would be more advantageous for a family to buy more ordinary milk than to buy a lesser volume of so-called "improved" premium milk. Any fortified milk must be a premium product since its production will be expensive. If the sales volume of such milks remains small, or falls after being built up by advertising, as has often been the case in the past when special dairy items have been promoted, the distributor may find that he has an incubus on his hands. He cannot easily drop such items so long as even a small number of customers continue to ask for them, and the cost of preparing a few units for distribution may result in loss.

It is believed, too, that if milk distributors yield to the temptation to follow the trend of the times and put on the market fortified milk, and give it the publicity necessary to create demand, they will be doing a disservice to their customers by creating a belief that ordinary milk is not the superior food that it has been extolled to be, and that it needs doctoring to make it a desirable item for the consumer to purchase. Every nutrition authority

during the past twenty-five years has lent the influence of his reputation to the proposition that ordinary milk is a superior food and an economical purchase, that it is the best single supplementary article of diet among the protective foods.

Now to promulgate the idea that milk improved in one way or another is preferable to the natural product is misleading to the public. It will create confusion in the public mind, and in the long view is an unsound policy from any viewpoint.

No one has ever recommended that milk shall be used otherwise than as one component of an otherwise well selected diet in America. In its natural state it possesses the outstanding properties we desire as a supplemental food. It is not recommended as a source of iron, copper or manganese, or ascorbic acid, which nutrition authorities all agree should be secured from other sources. There is no advantage whatever in making any single food a complete food for all nutritional purposes. We have a great variety of appetizing foods and we will fare best by taking a variety of foods, each of which provides something which is needed.

Quite apart from any nutritional consideration, it seems undesirable to permit fortification of milk other than with vitamin D on account of the burden which such practice would put upon health officials. Constant inspection and assaying would be necessary in order to insure that such special items are what they are stated to be. If every distributor were to sell fortified milk, the burden of official supervision would become very great, while the service rendered and the expenditure involved would be of doubtful value.

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## PROSTITUTION IS AN AXIS PARTNER

IN the week beginning Monday, December first, we read *Plain Words About Venereal Diseases*, by Thomas Parran and R. L. Vonderlehr, respectively Surgeon General and Assistant Surgeon General of the United States Public Health Service. Also we read and listened to the repercussion and controversy which followed in the wake of this book's publication. By the end of the week we were preparing an editorial which possibly would have prolonged the argument, but the events of Sunday, December seventh, changed all this. There is now no time for deciding whether or not the Army has been lax in enforcement of the provisions of the May Act for repression of prostitution around military establishments; and neither is there time for deciding whether or not the blunt criticisms by the authors of this book were in good taste or along proper governmental channels. In the face of the present situation these matters become academic and must be thrown into the discard with other fine-point disputes which we thought we could afford when we were preparing somewhat leisurely for defense.

From here on, in matters relating to the public health, the offensive must be taken just as it must be gained in military and naval affairs. It follows then that a new hard-hitting and planned attack must be launched. In regard to venereal diseases, as they relate to the military and naval forces, the following premises, numbered one through five, appear to lead logically to the conclusion set forth below as number six.

1. The venereal diseases have always been a menace to the health and efficiency of soldiers and sailors.

2. Prostitution is the great reservoir of venereal disease.

3. Evidence at hand indicates that prostitution has been flourishing in many areas near military and naval establishments.

4. Unless some unknown and strangely protective new factor has entered into the situation, prostitution existing near naval and military establishments is a menace to the health and efficiency of the Army and Navy.

5. The May Act, signed by the President on July 11, 1941, prohibits prostitution within such reasonable distance of military or naval establishments as the Secretary of War or the

Secretary of Navy, respectively, shall determine to be needful to the efficiency, health, and welfare of the Army and Navy.

6. The May Act should be enforced quickly, effectively, and continuingly, without recriminations, hair-splitting arguments, or gloomy forebodings as to usurpation of state and local authority by the federal government.

Let's give neither aid nor comfort to the enemy.

## VERTICAL VERSUS HORIZONTAL ADMINISTRATION

IT is interesting to observe that an increasing number of public health workers are becoming conscious of a need for more clearly defined administrative relationships between themselves and their coworkers, between the individual service units within their organization, and between their own organization and other organizations. Even more significant is the fact that many of those who were once unrestrained and vehement champions of one method of administration or another are now, as their programs have expanded and their responsibilities changed, willing to see some virtue in types of organizations and methods of administration which previously they had damned roundly. This developing interest and this new tolerance may be put to good use and perhaps to severe test in bringing about a just peace between the adherents of "horizontal" administration and the proponents of "vertical" organization and procedure. These quoted words, incidentally, are not good terms, but they are generally understood, and for want of better they must be used.

How best to combine the imagination and planned strategy of a technical staff with the stop-gap technics and realities of the firing line is not, of course, a new problem or one confined to public health. It is encountered in industry, in business, in the military services, in hospitals, and in fact in any situation where there is a central directing group of specialists on the one hand and on the other far-flung operations of the organization as a whole, under the immediate charge of local directors. In public health administration the objective, naturally, is to provide a smooth and untortuous channel along which the knowledge and facilities of the central organization may flow to and through local units without washing away that authority which the local director must possess if he is to perform successfully. Complete autonomy of the local units, say in the director of a city district or in a county health department, tends to inhibit the flow of technical service and advice from specialists in the central office to their corresponding specialists or technicians serving in the local units. As against this, to have special services of an operating health department, as in tuberculosis or public health nursing, directed by bureau chiefs in a central office, interferes seriously with coördination of the various activities of the local unit and makes it impossible for the director of that unit to function other than as an administrative clerk. Personalities, too, and guild consciousness of those in the many professions or near professions of public health, and even the respectable urge to do a good job of work, seem to have added confusion to this already difficult problem.

No wise man will speak ex-cathedra on this subject, and the more emphatically one argues for either complete vertical or complete horizontal administration the more likely is he to be in error. Central bureau chiefs and the services which they and their staff render are largely concerned with what to do and how to do it in their respective fields. The local director is responsible not only for insuring high

standards in what is done and in the way in which it is done, but also he is the only person in position to decide where to render local service and when and to whom, with the personnel and resources locally available. No victories are won with only staff work, be it ever so brilliant, nor with only tactical officers, be they ever so energetic. What, seemingly, is needed in public health administration is an organization and procedure which will combine provisions for central technical guidance with assurance of responsibility and authority for the local director. It is not probable that any one fixed pattern will serve all places. Wisdom appears to indicate that the best in vertical and horizontal administration be conserved, harmonized, and utilized.

## THE RIM OF THE CARIBBEAN

ONE is inclined, naturally, to discourse upon his or her own recent experiences, provided they are reasonably respectable, and we claim no exception to this tendency. Having just swung around the rim of the Caribbean, we want to talk about it, not as a travelog, but rather from the standpoint of the health work being done in that area. Of course, since our progress was a somewhat rapid and centrifugal one, we are not in position to speak authoritatively or in detail, but in spite of this we did gain an impression as to the health problems and practices of some of the countries bordering on the Caribbean.

In these countries one finds still a strong and necessary interest in the fundamentals of sanitation: anti-mosquito work with all this implies for control of the various genera and species with their divergent habits and sometimes seemingly bizarre choice of breeding places; excreta disposal with the programs ranging from squat-hole type of latrines to municipal sewage plants and on to wearing-of-shoes campaigns; small and large water supplies, abattoirs, and meat markets, garbage fills of low ground, and village incinerators—all loom large in these intensive and widespread sanitary programs. Superimposed on such fundamentals are efforts to carry on the more or less conventional public health activities seen in a more or less conventional health department in the United States. And over and above these things are to be seen services which reflect local problems: research and field work in schistosomiasis, in dysentery, in hookworm, in production of anti-venom serum; the far-flung listening posts of yellow fever control, made up of viscerotomy services in Venezuela, Colombia, and Panama; the undertakings to meet problems arising from the establishment of the defense bases of the United States in some of these countries.

One sees, too, on most of the rim of the Caribbean, strongly centralized health departments, where complete authority and financial responsibility rest with the central government. The director of the national or federal division of tuberculosis or maternal hygiene, for instance, is not found in an administrative office, but in a clinic rendering direct service to citizens who live near the seat of government. This, of course, strikes a North American visitor as unusual. One is inclined to wonder if a federal chief of service, so preoccupied in direct local activities, can possibly have time for or an interest in the complex problem of providing that service on a nation-wide scale. Yet this close touch of chiefs with the realities of action is refreshing, and certainly is not to be criticised merely because it is strange. In some of these countries, but not all, serious attempts have been made to extend public health work through a health unit system. Quite in contrast to North

American sequences and associations, many such units have come into existence by being engrafted upon an already existing dispensary service or are the result of the pulling together, locally of special diverse services of a federal department of health which previously had operated independently of each other in that locality.

Unfortunately, in Caribbean countries, few medical men have made public health work a career. The physician who enters the health service, in most instances regards his term of office as temporary, and this attitude is shared by his colleagues and the governmental authorities. Though a number of men have received postgraduate instruction in public health, full-time service is unusual. Perhaps if, in the matter of career work, the United States had set a better example, it would have benefited the health services of these countries to the south of us. But let it not be imagined that the flow of public health knowledge must necessarily be from north to south. There is an enthusiasm, an energy, and a realism in the public health work of the Caribbean from which North Americans may well profit.

# Credit Lines

A Selective Digest of Diversified Health Interests

D. B. ARMSTRONG, M.D., AND JOHN LENTZ, M.S.

## WHAT'S THE USE?

These are unhappy times—"times that try men's souls." It is only natural that many of us who heretofore have taken pride in our work and have drawn spiritual sustenance from it, are suddenly asking ourselves: "What's the us?" When war came, we were in the midst of a manuscript dealing with the history of a great experiment in life conservation. At once we felt that this, as well as other undertakings of ours, were innocuous projects having no relevancy to the present scene: the here and the now. We thought, too, of "Credit Lines." Futile to continue it, we felt. What difference does it make whether health pamphlets are excellently written and attractively illustrated? Who cares now whether our posters are nicely designed and competently executed? Then we looked about us and sensed what it would mean if everyone surrendered to bafflement or lost himself in emotional flight. Gradually, we realized that it was unthinkable to surrender to a "what's-the-use" philosophy in times like these. There are many urgent problems in the offing that health workers must solve, and until these new problems challenge us, it is best to continue with the tasks at home. There will be new and special opportunities for service in every phase of public health as long as our country is em-

battled. Let us be ready to give our best to the difficult and complicated jobs that may be ours to do, so that in the end we may have the satisfaction of knowing that health personnel shared in the triumph of a wise and provident society over one of decadence and perversion.

What's the use? Plenty!

## A DAY OF HEALTH EDUCATION

Approximately 100 health educators representing the official and voluntary health, medical, and social agencies in the New York City area attended the second annual one day Health Education Conference, held under the auspices of the New York Academy of Medicine, on November 8, 1941. The program centered around the theme of directing attention to the objectives of health education and the methods and technics best suited to accomplish these objectives. Four very stimulating and enlightening papers were presented that brought out many new concepts regarding the general theme of the meeting.

Dr. Edward J. Stieglitz, of the National Institute of Health, read a paper on "The Rôle of Health Education in Present-Day Medicine" that was a very scholarly analysis of the individual's responsibility for his continued health and of the pressing problems of senescence. Dr. Stieglitz emphasized that health is more than absence of disease and that, although there is no such thing as perfect health, it is an ideal to be approached as nearly as possible. He

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stated that the measurement of health is individual, not general, and involves the prediction of future physical fitness as well as the attainment of present fitness. Dr Stieglitz pointed out that there are two types of preventive medicine, wholesale and retail, the wholesale being the activities of public health dealing with the prevention of exogenous injury, the retail dealing with the maintenance of individual health. The wholesale type has now advanced to a point where the public is protected from many infections through a safe environment and immunization. It is effective mainly without the efforts of the recipient and has affected largely the diseases of youth.

In the retail type of preventive medicine, Dr. Stieglitz maintained that the pediatricians have been the principal leaders, but little advance has been made with the degenerative disorders of old age. The retail method requires health inventories which are much more than routine physical examinations. These inventories involve expense, skillful examiners, and intimacy. They must be voluntary and they require initiative on the part of the individual. Physicians as well as the public must be educated to further advances in the field of health inventories, Dr. Stieglitz said.

Another interesting section of Dr. Stieglitz's paper brought out the fact that no disease can be considered to have but one cause. Etiology was divided into three factors: predisposing, provoking, and perpetuating. The attack against many diseases must be primarily against the predisposing rather than the provoking cause, and the perpetuating must also receive serious attention. The advancing age distribution of the population has caused a shift in the character of the principal diseases from infectious to degenerative. Gerontology, the science of the process of aging, has become an important study and introduces not only new clinical problems but socio-

economic problems which demand the coöperation of workers in many fields allied to medicine. The speaker said that at present we cannot hope to add many more years to life, but we can add more life to the years and make longevity a blessing rather than a burden. Man should become, like Oliver Wendell Holmes's "Wonderful One Horse Shay," a well balanced machine in perfect operation until the end. This will make man useful to society in his years of maturity and good judgment, rather than a burden on the shoulders of youth.

Two important points which Dr. Stieglitz particularly stressed were the necessity for increased accuracy in lay medical writing and the pressing need for well adult clinics where information regarding nutrition and endocrine disturbances, among other things, could be obtained.

Selskar M. Gunn, Vice-President of the Rockefeller Foundation, who is now engaged on a project for the National Health Council, spoke to the conference about an experiment in education in rural China in which specialists in social, economic, agricultural, and medical fields were brought together, how barriers between them were broken down, and how they were taken into the field to see their common problems and work out methods for their solution. Thus started on a sound basis, even war and the migration of refugees could not stop the experiment. Mr. Gunn expressed the belief that in the United States socio-economic problems and health problems must likewise be dealt with, as they are inseparable. In attacking a problem, the Chinese first go into the field, learn the facts, then apply the educational technics needed. It was felt that we in this country could avoid a great deal of fumbling if we would first take time to get at the basic facts. Facts first, technics later.

A paper, Psychological Barriers in

Health Education, was read by Edward L. Bernays, well known public relations consultant. This paper stemmed from a study which the author made of health education in the United States at present. He drew a rather scathing picture of what he considered wastefulness in health activities because of lack of coordination. Mr. Bernays pointed out that the barriers to health education are both psychological and physical. The psychological barriers involve the attitudes of health educators, who often are not very efficient, and the attitudes of that part of the public that resents the doctor when well and that is bound down by ignorance, habits, taboos, and prejudices. The physical barriers, according to the speaker, include inadequate budgets, lack of coordination, conflicting claims made in health information published by various agencies, materials that are out of date, etc. Mr. Bernays recommended that a voluntary National Council of Health Educators be formed by all health education groups to pool resources, prevent duplication of effort and needless expenditure of money and to maintain continuing research and evaluation of technics in health education.

Dr. Allen W. Freeman, of Johns Hopkins School of Hygiene and Public Health, gave a direct and forceful paper on Health Education by the Private Practitioner, the Voluntary Agency, and the Department of Health. He maintained that health education cannot become a major part of the practitioner's activity as long as the doctor's bread and butter depends upon his practice, but that it could become a more important part of his practice if he were given the proper point of view in medical school and if it were made easier for him in his practice to educate his patients. Dr. Freeman pointed to the important contributions made to health education by voluntary agencies. He felt that they had been most ingenious in developing

methods and in carrying on continuing programs of education. Departments of health, the speaker said, vary greatly in their health education activities — the large cities requiring much more organization than small rural counties. In the latter, health education must be the duty of the health officer, the nurse, the sanitation officer, and even the clerk. The nurse was termed the health educator *par excellence*. Proof of this has been revealed by studies which have shown that the nurse, visiting prenatal patients in the home, carries out more effective teaching methods than some of the best prenatal clinics.

The formal papers were followed by round table discussions, and a general summary of the day's proceedings was excellently outlined by Dr. Henry E. Meleney, of the New York University College of Medicine.

The New York Academy of Medicine and its Committee on Medical Information deserve the thanks and appreciation of all in attendance at this helpful conference.

#### WELCOME ALLIES

During this time of national emergency, public health personnel is demonstrating more than ever its leadership in democratic procedures by participating in many activities which have a bearing on the health of the nation. The number of professional groups which have something to contribute to the science of healthful living is becoming more and more striking. The National Association for Nursery Education held its Ninth Biennial Conference in Detroit during October, 1941, and the field of public health was well represented through physicians and pediatricians, educators, and welfare workers. The theme of the Conference "Life, Liberty, and Happiness for Children NOW" was and will continue to be of vital concern because emergency measures have made it more necessary than

ever to provide suitable care for the preschool child. The English and the Canadians have given us through their experience numerous reasons why early childhood education is essential to any national program. It is the children who must carry on, and the preschool years are vitally important because of the influence that they bear on the growth and development of a healthy people. A healthy start in life, both mental and physical, is the birthright of every child. Take notice of these nursery school directors and teachers. They need your guidance, and in turn they have much to give which has a bearing on the public health.

#### HAVE YOU SEEN . . .

*Any issues of the Club Talk Series issued by the Medical Society of the State of New York?*

These "talks" are designed to be presented by a lay person at club meetings or they may be used as publicity releases or as radio material. The Series covers a varied list of topics, two of the latest dealing with fear (as a factor in mental health) and with cancer (in which facts about the disease are set forth for school groups). We recommend this series of "talks"—they are replete with sound, fundamental information presented in a popular, appealing manner. If interested, write to the Society at 292 Madison Avenue, New York, N. Y.

*The venereal disease pamphlets published by the Massachusetts Society for Social Hygiene, Inc.? (Address 1146 Little Building, Boston, Mass.)*

Two publications on gonorrhea and syphilis issued by the Society are especially commendable. One is addressed specifically to the man in uniform and stresses this fact: Here are two diseases you *don't* have to have. The text is straightforward, employing terms and

phrases that are used in man-to-man discussions on this subject. The second booklet describes syphilis and gonorrhea as "saboteurs of our national defense." It is likewise a straight-from-the-shoulder exposition in which prostitution, the road house and the tavern are discussed. The two booklets are attractively executed. They bear none of the earmarks of hastily prepared "handouts," which is more than can be said for some of the publications on the subject that have recently been issued for the man in uniform.

*Any issues of "Your Health," a bulletin published by the Newton, Mass., Health Department?*

This health department is doing an outstanding job in publicizing its services in the community it serves. A recent issue was devoted to the prevention of communicable disease. Immunization procedures were summarized and other methods of prevention were listed and briefly discussed. This is one of the best health bulletins for "home consumption" that reaches our desk.

*The fourth booklet in the Workers' Health Series?*

"Clara gives BENZOL the run around" is the title. This booklet is a clear concise statement regarding the effects of benzol poisoning and preventive measures that must be taken to avoid it. The text, as is characteristic of other booklets in this Series, is appropriately written for workmen. Available from the Superintendent of Documents, Washington, D. C. Price, 5 cents.

*Volume I, Number I of the National Foundation News?*

This four page publication, which follows the newspaper format in layout, is to be issued monthly by the National Foundation for Infantile Paralysis, Inc., for its chapter officers and members

throughout the United States and its possessions. The publication is decidedly "newsy" in tone, reflecting activities of the Foundation in the fields of research, epidemic aid, and education. The initial volume leads us to believe that this publication will soon have a wide circle of interested readers in public health.

*The reprint from the American Journal of Public Health of the Proceedings of the Nineteenth Annual Conference of the Milbank Memorial Fund?*

Readers who are familiar with this excellent series of papers will surely welcome a bound copy of this material for reference and library purposes. Write to the Fund, 40 Wall Street, New York, N. Y., for copies.

A POSTER PLEA

On more than one occasion, we have "had our say" about so-called modernistic technics and design as applied to health posters. A recent communication to the editor of a popular magazine reveals that there are others who share our general feeling—to wit:

"When I was in New York a while ago I went to an exhibition called Posters for Defense. . . . I am sending you a leaflet from that exhibition. . . . I would like to ask you if you don't think there is something wrong about these posters that are supposed to make a hundred million people feel like defending democracy.

"So many of these posters are machine-like and cold, and so many of them make people look like robots and caricatures. I think I can appreciate the skill and talent that have gone into these posters, but I wonder if skill and talent are enough, all alone, with so little warm human quality to move the man in the street. Maybe abstract design can arouse emotional response in the connoisseur, but can it make the average housewife save her dimes for defense stamps or persuade a mechanic to enlist in the Air Corps? I want your opinion. I would like to know if you don't agree that posters which hope to symbolize the aims of democracy should represent their themes in human, understandable words and pictures, and not in designs that suggest the mechanistic,

unsentimental and regimented things we're fighting."

The editor agreed 100 per cent with his correspondent and added: "Let the government put in a hurry call for such human artists as Steichen, Norman Rockwell, etc., men who see with their hearts as well as their eyes."

To which we add: Artists designing health posters—PLEASE NOTE. The comments quoted above apply as well to health posters as to defense posters.

MAGAZINE ARTICLES

"Middle Age Jitters." Raymond G. Fuller. *Cosmopolitan*. December, 1941.

"How to Choose a Doctor." Robert D. Potter. *Good Housekeeping Magazine*. November, 1941.

"The Truth About Caesareans." Maxine Davis. *Good Housekeeping Magazine*. November, 1941.

"How Much Do You Know About Heredity." Amram Scheinfeld. *Ladies Home Journal*. November, 1941.

"The Danger of Nervous Fatigue." Edward Spencer Cowles, M.D. *Good Housekeeping Magazine*. December, 1941.

"Eating for Oomph!" William L. Laurence. *Ladies Home Journal*, December, 1941.

"Was I Dreaming?" Gretta Palmer. *Ladies Home Journal*. December, 1941.

"The Great American Stomach." *Fortune*. December, 1941.

"Sister Kenny vs. Infantile Paralysis." Lois Mattox Miller. *Readers Digest*. December, 1941.

"These Millions Need Not Die." Paul de Kruif. *Readers Digest*. December, 1941.

"Too Much Surgery?" Miles Atkinson, M.D. *The American Mercury*. December, 1941.

JOTTINGS

The request for slogans in the October issue of "Credit Lines" prompted readers to submit the following: All for

Health and Health for All, A Healthy Nation is a Wealthy Nation, Public Health for Public Happiness. Let's have more suggestions. . . . Letterheads can be used to spread health information, as demonstrated by the Newark, New Jersey, Department of Health. The official stationery of the department carries the following message: "Pneumonia Picture: sudden onset, pain in chest, high temperature and chills, shortness of breath, cough and rusty sputum. Call the doctor immediately." . . . Now that the long winter evenings are here, there should be time to read those books you've put aside for leisurely(?) hours. Be sure to include on your list *The Man Who Lived for Tomorrow* (the biography of William Hallock Park), *The Doctors Mayo*, and *William Henry Welch and the Heroic Age of American Medicine*. These are outstanding books—books to chew and digest, not merely to taste and to swallow. . . . Nutritionists have long insisted upon informative labeling of food products. Here's an example of the nth degree of informative labeling displayed in a restaurant: "Hard boiled egg—1 cent; wear and tear on chicken—3 cents; rooster's fee—1 cent; total cost—5 cents." . . . The book department of a large metropolitan store recently was puzzled over the poor sale of one of the year's finest cook books entitled "100 Ways to Please Your Husband." Good cook books always sell well and the merchandising manager wondered what was holding this one down. One of the sales girls suggested that the books be removed

from the cook book counter and placed on display in the medical and health book section. The suggestion was followed. Result: "100 Ways to Please Your Husband" was sold out on short order. . . . The Greater New York Safety Council advises all motorists approaching grade crossings: "STOP, LOOK, LISTEN, and LIVE! Don't depend on the watchman—or even the gates. Train the mind to mind the train!" . . . We understand that Sister Kenny, although not present in person, largely dominated the discussions on therapy at the 1941 annual meeting of the National Foundation for Infantile Paralysis. It seems to be generally agreed that Sister Kenny's procedures are a revolutionary contribution to the treatment of acute poliomyelitis. . . . Translating scientific material into the tongue of common communication is difficult and the work that some popular writers have done in this connection is to be admired. However, when certain vitamins are referred to as "wham" and "oomph" vitamins, it seems to us that popularization is being carried a bit too far. . . . The Pennsylvania State Department of Health has produced a film for lay audiences on pneumonia, stressing the general rules of prevention and treatment, including home nursing care. . . . The National Foundation for Infantile Paralysis has produced a one reel sound motion picture for lay audiences on the epidemiology and treatment of poliomyelitis. We believe the film will be available in both 35 and 16mm. prints.

## BOOKS AND REPORTS

**Handbook of Communicable Diseases**—By *Franklin H. Top and Collaborators*. St. Louis: Mosby, 1941. 682 pp. Price, \$7.50.

Out of the rich and interesting experience of the Herman Kiefer Hospital and the Detroit Department of Health has come this new manual. The first section presents a brief and general consideration of infection and immunity, of epidemiology, of regulations for control, of specific immunizing procedures, of serum sickness, and of nursing techniques in the home and in the hospital. Then follows a detailed text on each of the communicable and infectious diseases, presented under the following topical headings: Definition, History, Infectious Agent, Epidemiology, Immunology, Pathology, Symptoms, Types, Complications, Differential Diagnosis, Prognosis, Treatment, Nursing Care, Prevention, and References. The clinical descriptions are supplemented by 73 half-tone and 10 colored plates. In the appendix are tables showing the associated conditions, complications, and final diagnoses for several thousand admissions to the Herman Kiefer Hospital; treatment schedules for syphilis and rabies; the Detroit communicable disease regulations; a glossary of technical terms.

The book is a convenient compendium for health officers, internes, medical students, and nurses. Because of the necessarily brief space allotted to each disease, it is of an elementary rather than of an advanced character. Not only does the book have merit in keeping pace with the advances of medical science, but the author and his collaborators are equally competent in

discussing both the clinical and public health aspects of these diseases. The book is distinctive in the balance achieved between prevention and medical care. KENNETH F. MAXCY, M.D.

**The Story of Clinical Pulmonary Tuberculosis**—By *Lawrason Brown*. Baltimore: Williams & Wilkins, 1941. 411 pp. Price, \$2.75.

This posthumous book (Brown died in 1937) is much more than a story of clinical pulmonary tuberculosis. The three chapters: The Visit in 1700, The Visit in 1800, and the Visit in 1900 are artistically drawn pictures of the diagnosis and treatment with a rich background of the contemporary scene of life. There are chapters under the heading of Diagnosis of Early Tuberculosis, including Laennec and His Successors, Early Publications in Germany and Austria, Diffusion of Knowledge in England, Diagnosis in America. About 100 pages are devoted to the story of Modern Surgical Treatment of Pulmonary Tuberculosis. Under Some Side-lights of Importance, we find chapters on Laennec and His Writings, The Story of the Stethoscope and Early Medical Journals. Homer L. Sampson wrote a chapter on Diagnosis by X-rays and Edward W. Archibald a chapter on the Development of Surgical Methods in Treatment.

Brown, who was one of the most outstanding men of his time in clinical tuberculosis, failed to mention his own contributions to the story, though we find reference to them in Sampson's chapter. The author had personal acquaintance with many of the leaders in his field both in this country and

abroad; indeed he had many friends among them. He was a scholar and a student of history, particularly the history of medicine. His lectures on the history of tuberculosis given to post-graduate students at the Trudeau School were highly appreciated. Thus this book is not a compilation of *ad hoc* readings but the result of intimate knowledge acquired by many ways during long years.

The historical events Brown presents are always interesting because they are connected as phases of a development. The style has grace and color. The chapters by Sampson and Archibald are informative and interesting. The book might be enjoyed by persons who are interested in the development of the science and art of medicine, regardless of their field of work.

JULES FREUND, M.D.

*The Premature Infant (Its Medical and Nursing Care)*—By Julius H. Hess, M.D., and Evelyn C. Lundeen, R.N. Philadelphia: Lippincott, 1941. 317 pp., 74 ill. Price, \$3.50.

The development by the authors of a large central station for the care of premature infants in the Michael Reese Hospital in Chicago has permitted organization of a highly specialized system of medical and nursing care. This book contains a detailed description of this system, stressing the particular problems of transportation of premature infants to the central station, of their segregation from other infants, of control of the temperature and oxygen content of the environmental air in the Hess oxygen unit, of furnishing a supply of human milk, and, finally, of providing adequate amounts of highly skilled nursing care.

A critical evaluation of alternative methods, for example, of artificial feeding, of oxygen therapy, or control of environmental temperature and humidity is not furnished. Furthermore, the

bibliography is inadequate for a reader interested in learning the details of these alternative methods from the literature.

The discussions of physiology, of growth and development, the factors causing prematurity, are not of the same caliber as the chapters on medical and nursing care.

The book is, then, a good exposition of the subject indicated in the subtitle—medical and nursing care (of the premature infant)—in the light of the authors' experience. Because the latter has been so extensive, the book is a valuable contribution and can serve as a guide for physicians and nurses who attend these infants and for administrators interested in setting up comprehensive plans for their care.

HARRY GORDON, M.D.

*Sanitary Engineering*—By Harry G. Payrow. Scranton: International Textbook Company, 1941. 482 pp. Price, \$4.00.

While the general field of sanitary engineering has in comparatively recent years expanded to cover a large number of activities relating to community health and welfare, this textbook covers only those subjects which were the original conception of this branch of engineering, viz., water supply, sewerage, and water and sewage treatment. The subjects covered include hydraulics of water supply, stream flow (methods of measurement and hydrology), reservoirs and dams, ground water, water consumption, water intakes and distribution systems, pumping water, water treatment, quantity of sewage and storm water, sewerage systems, characteristics of sewage, sewage disposal and treatment, sedimentation and chemical precipitation, oxidizing processes, sludge treatment and disposal, miscellaneous treatments and sewage plant operation. The book should serve the author's announced intention that the text be used in an introductory course for sani-

tary engineers and to give civil and chemical engineers a glimpse of the problems involved in these branches of sanitary engineering. F. J. MAIER

**Delinquency Control**—By *Lowell Juillard Carr*. New York: Harper, 1941. 447 pp. Price, \$3.50.

This book represents a fresh and vigorous treatment of an old sore-spot. As director of the Michigan Child Guidance Institute, the author knows what should and can be done, and he believes that, under informed leadership, juvenile delinquency can be materially reduced.

The limited measures in force today are still on a "myth-minded" level, and Dr. Carr cites examples to show how often complex matters are approached from the side of intuition and impulse. He maintains that modern skills must be applied to personal counseling, the elimination of blighted areas in the community structure, and the rejuvenation of organizations that fail, under present conditions, to reach youth who need help.

His analysis of social breakdown and personality conflicts is bolstered with pertinent statistics and challengingly set forth. The technics prevailing in our correctional institutions, probation departments and school systems are considered and found wanting in the face of an estimated 9,000,000 handicapped children under 18 in "high-risk" situations in the United States. School teachers fall short in the timely detection of emotional difficulties, courts do not consistently sift out the most hopeful prospects for probation, and probation itself too frequently degenerates into little more than a bookkeeping procedure.

Since conventional methods have not produced any appreciable decrease in delinquency, the author urges lay participation in the campaign, as in the coördinating council movement which

started in California in the early 1930's, and has spread across the country, with organizations built around social agencies and dependable lay individuals in the community.

In his final chapter Dr. Carr describes the Michigan Child Guidance Institute, established in 1937 under the University of Michigan, and furnishing advisory services and personnel to communities which, under this direction, assume responsibility through their existing agencies for action on their own problems. Despite the niggardly appropriations voted by the legislature for this valuable work, local results thus far have been encouraging.

As an advanced textbook in juvenile delinquency, a review for those who need a "refresher" and a guide to anyone seeking practical suggestions that have vision but are not visionary, this volume should bring inspiration. To those whose primary interest is in public health it will prove doubly significant as demonstrating that the public health concept—not treatment alone but also control and prevention—applies with equal force in the field of delinquency.

AUSTIN H. MACCORMICK and  
WILLIAM H. KINNEY

**Orientation in School Health**—By *Clair V. Langton, Dr.P.H.* New York: Harper, 1941. 680 pp. Price, \$3.00.

After turning the pages—there are over 600 of them—from stem to stern and reading much, I emerged with a very satisfying feeling.

This is a textbook primarily for teachers and teachers in training. All prospective teachers ought to be familiar with it. It is fair and temperate. It was written to emphasize points in the school health field that have not been adequately stressed partly because they have not been readily available. Deliberately omitted are chapters on what health material to teach elementary



school children and how to teach. Physical education is also left out because these two subjects are believed to have been quite adequately covered elsewhere.

The author is also aiming at another group for he states that experience, training, and education have not given the educational administrator "a clear insight into what health is; how it may be obtained; and still less, *how* this work may be organized in the school."

The chapters are up to the minute. School health service is excellently covered. In addition to the control of disease in general, there are rich chapters on Nutrition, Oral Hygiene, and Tuberculosis. Evidently a long road has been traveled in the last 20 years in the lighting of school buildings. Sanitation and Planning of the school plant, including ventilation, is a practical chapter. The health of the teacher is given some attention.

References are plentiful, many from reports of committees of the A.P.H.A.

This book ought to help bring departments of education and public health closer together.

GEORGE T. PALMER, DR.P.H.

*The Control of Tuberculosis in the United States—By Philip P. Jacobs, Ph.D. (rev. ed.) New York: National Tuberculosis Association, 1940. 387 pp. Price, \$2.00.*

The 1940 edition of *The Control of Tuberculosis in the United States* by the late Dr. Philip P. Jacobs should be read by every physician and worker interested in public health or in socioeconomic problems relating to health. Moreover, every health and medical-social worker would profit by having a copy available for ready reference. Not only has there been an appreciable increase in our knowledge of the public health and social aspects of tuberculosis since the publication of the 1932 edition of this book, but there have been paral-

lel development and improvement in administrative methods and technics which the author has included in this new edition.

Clinical tuberculosis in an individual is but a symptom of a community public health and economic problem. This book not only deals with the fundamentals in community organization and administration to meet the tuberculosis problem but, by reviewing the newer epidemiological or control measures, the author reveals new areas of administrative possibilities. Whether one's primary interest is concerned with the difficulties of organizing a public health program to meet community needs, or whether it is concerned with the administrative policies and procedures which would be conducive to sound public health education, economical and productive case finding, or circumstances related to the domiciliary control of the disease (especially as it may be related to public health nursing), this volume provides the key for solving these and similar problems. Moreover, the references selected and recommended by the author provide an excellent index of authoritative data and material pertinent to the many details of the tuberculosis problem.

In view of the declining tuberculosis death rate, the chapters on case finding and tuberculosis control, in particular, deserve to be read and reread. Not only does the text of these chapters contain many important and pointed statements, but throughout each chapter may be found a description of many current policies of organization and administration.

ROBERT E. PLUNKETT, M.D.

*Medical Work of the Knights Hospitallers of Saint John of Jerusalem — By Edgar Erskine Hume. Baltimore: Johns Hopkins Press, 1940. 371 pp. Price, \$3.00.*

The historically-curious will be glad to see this story, first printed in three

numbers of the *Bulletin of the Institute of the History of Medicine* in 1938, now available in book form—for this is the only account in English of the work of these famous hospitallers. Organized in the 11th century they have fought their way across land and sea through the centuries protecting crusaders in medieval days or Spanish refugees today—any and all who needed help. Their hospitals in Rhodes and Malta were models for all the world to follow and even in World War II one of their ambulance units was the first to come to the aid of the victims of The Athenia who were brought into Galway Harbor.

Dr. Hume's story is well told—and not essentially interrupted by the wealth of documentary support he gives the text. There are 130 figures.

LEONA BAUMGARTNER, M.D.

**Americans Live Longer!**—By *W. W. Bauer, M.D.* Indianapolis: Bobbs Merrill, 1940. 219 pp. Price, \$2.00.

In the first chapter of this refreshing book, the author reviews simply and clearly the accomplishments of medicine and public health that are contributing to longer and healthier lives for American people. The remainder of the book is a direct message to the person who has attained middle age with a desire to live to expectancy either without prematurely developing those afflictions of middle and older life or with a wish to live happily with his unpreventable health handicap.

Commonest causes of premature crippling and death after middle age, namely, heart disease, hypertension, glandular disturbances, cancer, diabetes, arthritis, and poor personal hygiene, are described in simple physiological terms. Emphasis is placed upon early signs of trouble and methods of preventing such trouble. The final chapter, A Philosophy of Health, should be read by everyone who has attained the age of forty and is looking for a pattern of behavior that

will carry him happily and healthfully through the years ahead.

The book is especially recommended to the specialist in geriatrics, to the clinician who is adviser to middle and older aged patients and to the public health man interested in the prolongation of life and prevention of health accidents in our aging population.

CHARLES E. SHEPARD, M.D.

**Personal Hygiene Applied**—By *Jesse Feiring Williams, M.D.* (7th ed.) Philadelphia: Saunders, 1941. 491 pp. Price \$2.50.

Two major difficulties attend the teaching of hygiene to college students. Most of these young people find it difficult to apply the principles of hygiene to their own and to community problems because of inadequate background in physical and social science. Most of them also have not acquired a point of view—a philosophy of living—that includes a consideration of positive health.

It is appropriate therefore that the author who has had many years of experience in teaching college students should emphasize in this seventh edition of his textbook five chapters developing a point of view, a *sine qua non*, for healthful living. The remainder of the book is devoted to the facts of anatomy, physiology, and bacteriology essential to an understanding of personal hygiene and an application of these facts to health problems of the individual. Although community health problems are touched upon throughout the book, no special reference is made to this subject.

There has been considerable revision in this edition which adds to orderliness of presentation. More space is devoted to mental components of physical health. There is a new section on vitamins, a new chapter on prevention of specific disease, a rewritten chapter on the endocrines, and an extension of material on human heredity. Teachers of college hygiene who are using this book as a

text will find the new edition a distinct improvement because its presentation is simpler and more orderly than former editions. Some may prefer to present the factual material in the latter chapters as an introduction to the philosophies expressed in earlier chapters. A carefully selected bibliography of recent publications at the end of each section will be found helpful for class discussion.

CHARLES E. SHEPARD, M.D.

**Biology of the Laboratory Mouse**  
—*Edited by George D. Snell. Philadelphia: Blakiston, 1941. 497 pp. Price, \$7.00.*

This book is the result of the combined efforts of nine investigators to bring together a large part of the available information concerning the mouse. Much of the information assembled was scattered so widely through scientific journals devoted largely to special fields as to have made it available only with difficulty to individual investigators. The book was written for research workers, particularly for those interested in genetics, tumors, and infectious diseases. As it has been put aptly by the editor it "presents a vertical cross-section of biological knowledge rather than the more usual horizontal cross-section" and deals with the mouse alone.

The text is divided into thirteen chapters dealing with embryology, reproduction, histology, spontaneous neoplasms, gene and chromosome mutations, the genetics of spontaneous tumor formation, the genetics of tumor transplantation, endocrine secretion and tumor formation, the milk influence in tumor formation, inbred and hybrid animals and their value in research, parasites, infectious diseases of mice, and care and recording methods.

The book should be of considerable value to research workers who use mice as part of their experimental material.

FRANK L. HORSFALL, JR., M.D.

**Rheumatic Fever in New Haven—**  
By John R. Paul, M.D. New York: Milbank Memorial Fund, 1941. 176 pp. Price, \$1.00.

Those who have followed Dr. Paul's studies in rheumatic fever (*A.J.P.H.*, Vol. 31, Page 611, June, 1941, and elsewhere) will be interested to see how he has brought to bear on the problems of one city our knowledge about this disease, using relatively new methods which he describes as "familial epidemiology, community epidemiology, and city epidemiology." Dr. Paul presents a picture of the clinical epidemiology of this chronic and acute systemic affection of protean nature which, as he points out, is a disease of childhood, a crowd disease, and commonest in temperate climates among urban people. It is fortunate that today's student of this disease can have this study to round out those of Perry and Roberts in England, of Maddox in Australia, of Clarke in Dublin, and of Hedley in Philadelphia. This study emphasizes the clinical aspects in relationship to the epidemiology of the disease rather than the statistical approach which has characterized many of the other studies.

Dr. Paul and the Milbank Memorial Fund are to be congratulated on this study which is unique in its field. The continuing influence of Edgar Sydenstricker, who had a long-standing interest in these studies, will be apparent to the reader.

R. M. ATWATER, M.D.

**Fatal Partners: War and Disease**  
—By Ralph H. Major, M.D. New York: Doubleday, Doran, 1941. 342 pp. Price, \$3.50.

This otherwise brilliant, extremely interesting and important volume is marred for me by a tiny fault, not due to Dr. Major. This is the publisher's use, as the symbol for medicine, of the winged staff of Hermes, messenger of the gods and patron of commerce,

thieves, and prostitutes. The symbol of medicine is the staff of Aesculapius, a cane with a single coiled serpent. That the United States Army makes the same mistake is no reason why people who could know better should do likewise. One purpose of Dr. Major's superb historical survey is to show that armies still can learn much from medicine.

Dr. Major, Professor of Internal Medicine at the University of Kansas since 1921, has much experience and skill in popularization of practical medicine, as exemplified in his earlier volumes, *Disease and Destiny* and *The Doctor Explains*. The ease with which *Fatal Partners* may be read gives little indication of the laborious care in assuring the accuracy of its detail and the artistic development of its story.

Dr. Major, like a modern Homer, tells simply but challengingly the long story of the relation between war and disease, from the epidemic factors contributing to the downfall of ancient Greece and Rome, through the pestilential imbecility of the Crusades, the swashbuckling venereal warfare of the Renaissance, the hideousness of the Thirty Years' Total War, Baron Larrey's pitiful efforts to mitigate the sufferings of Napoleon's loyal followers, the self-sacrificing care of the wounded by Florence Nightingale, the reaction to the horrors of Solferino which led to Jean Henri Dunant's organization of the Red Cross, our own ridiculous "Manifest Destiny," the only decent achievement of which was to teach us how to control typhoid and yellow fevers, the deliberate reversal by the Japanese in the Russo-Japanese War of the usual four to one ratio of death from disease to death from fighting, to the tragedy of World War I, and the present. It is a fascinating and thought provoking story.

Firmly Dr. Major insists that war itself has contributed nothing to medicine. During war physicians continue their merciful service to the best of their

ability. The best that war provides them in return is a vast laboratory in which to study the practical effects of whatever applications of their knowledge may be made. One of the greatest contributions to medicine, however, has come from that often misunderstood instrument, the United States Army. The Army Medical Library remains the most comprehensive and efficient repository of knowledge useful in medicine in the whole world. Perhaps, as a result of the present emergency, it will receive the fireproof building and full support it deserves. American physicians might help by telling this to their Congressional representatives.

CHAUNCEY D. LEAKE, M.D.

*Sociology and Social Problems in Nursing Service* — By Gladys Sellew, Ph.D., R.N. Philadelphia: Saunders, 1941. 344 pp. Price, \$2.75.

Adequate nursing care requires an understanding of the patient, his background, and his relationship to the society in which he lives. An appreciation of the effects of social and industrial conditions on health and the interrelationship of social and health problems as well as an understanding of the cooperative efforts which are contributing to their solution are a part of the professional preparation of the nurse. The presentation of the principles of sociology and their application to nursing is a large order for a single small book. In her attempt to cover a large field briefly, the author sometimes seems rather didactic, and she does not always emphasize the social factors and resources which might be of most importance to the average nurse. The young student might be somewhat overwhelmed by the problems which are presented and feel that a return to a primitive civilization is the only solution.

The units dealing with personality as a product of social life, the family, the community, and medical-social problems

will give the student a background for understanding the social and health aspects of nursing, and may stimulate her interest in public health nursing. This book will help the student to see nursing in relation to the community and society as well as to the individual patient.

The material is well organized, and the outline for the course in sociology in *A Curriculum Guide for Schools of Nursing* is carefully followed. Although this book was written as a text for undergraduate nurses, it could be read with profit by public health nurses who have had no basic courses in sociology. Each unit includes a bibliography which will guide the reader to references giving a more complete treatment of the problems. The glossy paper does not contribute to ease in reading.

ELLA E. McNEIL, R.N.

**Sociology Applied to Nursing—**  
*By Emory S. Bogardus, Ph.D., and Alice B. Brethorst, Ph.D., R.N. Philadelphia: Saunders, 1941. 294 pp. Price, \$2.50.*

This book was written by a sociologist and a nurse as a text for the basic course in sociology for student nurses. The authors state that their aim is to develop a concrete treatment of sociological facts and principles and give a social setting for the profession of nursing. The material is organized according to the outline suggested in *A Curriculum Guide for Schools of Nursing*, and throughout the book application of psychological and sociological principles has been made to situations common to the nurse.

This book will give the young student nurse some understanding of the factors which affect personality development and of the special problems which the nurse meets in her professional activities. She should also gain some understanding of the organization and functions of the family and the community.

Many of the subjects are treated very superficially, and the instructor will need to provide supplementary readings and interpret much of the material to avoid misconceptions on the part of the inexperienced student. The discussion of the health department, the visiting nursing association, the Red Cross public health nursing service, and the school health service is inadequate and confusing. Some of the references might be questioned as guides to a student in the selection of the most authentic sources of information.

Because of the oversimplification of much of the material, this book would not serve as a very satisfactory reference for public health nurses.

ELLA E. McNEIL, R.N.

**The Vitamin Content of Meat—**  
*By H. A. Waisman and C. A. Elvehjem. Minneapolis: Burgess Publishing Company, 1941. 210 pp. Price, \$3.00.*

This monograph will be a great convenience to investigators in the field of nutrition and to those engaged in such diverse fields as the vitamin assay of foods and the calculation of the vitamin content of human and animal dietaries. However, the scope of the book is too restricted and its presentation too technical to be of much value to the physician, the general reader, or the elementary student. On the other hand, it is an excellent monograph for advanced students of nutrition.

Data are given (mostly from the author's laboratory and hitherto unpublished) of the content in meat—raw and cooked—of the different members of the vitamin B complex—thiamin, riboflavin, nicotinic acid, pyridoxin, and pantothenic acid. The reputation of the authors is sufficient warrant for the reliability of these data.

There is a full discussion of the different assay methods of the members of the vitamin B complex, with comparative data on the results obtained by

different methods on the same material. This information is most timely and is badly needed.

Summaries are presented also of the vitamin A, D, E, K, and C content of meat. The data here were obtained from the literature.

A chapter is devoted to each of the vitamins of practical importance in human nutrition, giving the formulae and a brief discussion of the chemistry, pathology, and therapeutic uses. The discussion on therapy is uncritical and inadequate. To some extent this is compensated for by the large bibliography.

HENRY BORSOOK, M.D.

**Annual Review of Physiology—**  
Vol. III.—By James Murry Luck and Victor E. Hall. Stanford University, Calif.: American Physiological Society and Annual Reviews, 1941.

This volume is the third in the series of annual reviews of physiology, which forms a companion series to the *Annual Reviews of Biochemistry*. The editors have attempted to obtain reviews which present a critical analysis of outstanding papers in which the relation of the new work to that of former years is indicated, and in many instances they have been successful to a high degree. The review by Feldberg on Histamine and Anaphylaxis is an excellent example, and among others might be mentioned the section on physiological problems

related to aviation in the review on Respiration, by Schmidt and Comroe, and the section on diet in relation to liver injury in the review on Liver and Bile by Hawkins. In such short accounts of the present status of important topics in Physiology the volume has its major value to workers in fields outside Physiology. The work is, however, of great value even when the author has limited himself to a critical résumé of the year's work in his field by presenting references and summaries in a readily available form.

HERBERT HOFF

**One Hundred Years of Medicine in Minnesota—***Published by Minnesota State Medical Association, 1941.* 26 pp.

This publication by the Committee on Public Health Education of the Minnesota State Medical Association presents in pictorial form and with a minimum amount of text the story of a century of medical progress in Minnesota. The place of public health and of public health nursing is recognized with fair proportion and the reader can readily appreciate that high grade, modern medical care requires good facilities and is not a cheap commodity. This is a creditable production, comparing very favorably with similar efforts of other state medical societies.

R. M. ATWATER, M.D.

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**Definite, Positive, Clear**—Its title tells you all you need to be told at this point about this excellent paper, which is commended to all.

BECKER, J. E. Nutrition in Pregnancy. *Am. J. Nurs.* 41, 11:1245 (Nov.), 1941.

**"That One Talent Which Is Death to Hide"**—Twenty-four statistical findings about the prevalence and causes of blindness come from the productive hopper of the National Health Survey. Of every hundred thousand, 83 were blind in both eyes, 326 in one. Diseases were the major cause of complete blindness, accidents of partial.

BRITTEN, R. H. Blindness, as Recorded in the National Health Survey—Amount, Causes, and Relation to Certain Factors. *Pub. Health Rep.* 56, 46:2191 (Nov. 14), 1941.

**Ouch!**—No specific dietary factor or metabolic condition has been proved to cause or control dental caries in the fully developed human tooth. This forthright conclusion ends a summary of the voluminous recent literature upon caries and metabolism. (There appears to be no reference to the papers on fluorine vs. dental caries, however.)

BUTLER, A. M. Metabolic Factors in the Cause and Control of Dental Caries. *New Eng. J. Med.* 225, 19:746 (Nov. 6), 1941.

**Tough Food for (Administrators') Thought**—Half a million men and women in the productive ages (20-64) are in institutions because of some serious physical handicap or incapacitating chronic disease. Sixteen million have the same troubles, but are at home.

Only some fifty-odd millions, presumed to be in health, remain and they must carry the load of all. The several diseases and impairments are listed in the order of frequency. This is only a part of the dreadful information that you should have.

HALLMAN, D. E. Health Status of Adults in the Productive Ages. *Pub. Health Rep.* 56, 43:2071 (Oct. 24), 1941.

**Next Steps for the Blind**—Opportunities and responsibilities of official and voluntary health agencies in the conservation of vision are pointed out in this story of what has been accomplished by some health services.

HEERING, R. E. Helping America by Saving Sight in Childhood through Health Services. *Sight-Saving Rev.* 11, 3:179 (Sept.), 1941.

**Health for the Country Cousin**—In certain rural parts of the Province of Manitoba, medical service is given through "municipal doctors" who are engaged by the community at an approximate family levy of \$4.50 per year. A survey of two years' experience in seven areas indicates that under the conditions prevailing the method is successful.

JACKSON, F. W. Morbidity Survey in the Municipal Doctor Areas in Manitoba. *Canad. Pub. Health J.* 32, 10:491 (Oct.), 1941.

**Saving Children's Eyesight**—Many more of us than the specialists in child hygiene will find this item a valuable bit of educational material. It is written in plain English for the laity but in the matter of ophthalmology,

who of us isn't in that category? Nine chances in ten, you too think that farsightedness is better than normal distance vision. It isn't.

KNIGHTON, W. S. *Children's Eyes*. Sight-Saving Rev. 11, 3:200 (Sept.), 1941.

**One Small Straw That Points a Dreaded Wind**—Before the war, deaths from tuberculosis in Glasgow were stabilized at 960 per annum. During the first two years of war the deaths increased by 200. And this increased mortality is maintained for 1941. The working ages suffered most, and this suggests the influence of overwork, strain, ill-spent leisure.

LAIDLAW, S., and MAC FARLANE, D. *The Causes Underlying the Recent Increased Incidence and Mortality from Tuberculosis in Glasgow*. Brit. M. J. No. 4212:436 (Sept. 27), 1941.

**Icterohaemorrhagic Spirochetosis**—An agglutination test is described which will demonstrate the presence of specific antibodies in Weil's disease of more than one week's duration. The pathologists probably know about this, and the rest of us won't be particularly interested, but the item impelled me irresistably to spell out the jaw-breaking heading.

PACKCHANIAN, A. *Positive Agglutination Tests in Suspected Cases of Weil's Disease*. Pub. Health Rep. 56, 45:2145 (Nov. 7), 1941.

**Flies Found to Harbor Polio Virus**—Large numbers of flies were collected about a summer (health?) camp in Connecticut in which poliomyelitis occurred and two carriers were detected. The flies were macerated in sterile water and the washings instilled or injected into monkeys. Typical experimental poliomyelitis was produced. A second specimen of flies was collected in Alabama near households where polio cases had occurred. Again it produced experimental poliomyelitis.

PAUL, J. R., *et al.* *The Detection of Poliomyelitis Virus in Flies*. Science. 94, 2443:395 (Oct. 24), 1941.

**Preventing Congenital Syphilis**—Pros and cons of the premarital and prenatal blood test laws are presented quite impartially. Though some impressive statistics of syphilis discovered through these measures are presented, the author finds it difficult to state his opinion upon the matter. In his conclusion he reports 10 per cent of fetal and neonatal deaths still due to syphilis.

PECKHAM, C. H., JR. *Legal and Therapeutic Aspects of Syphilis and Pregnancy*. J.A.M.A. 117, 22:1863 (Nov. 29), 1941.

**That Ounce of Prevention—You'll** agree with the observation in this paper that the ultimate solution of the problem of deficiency diseases lies not in their treatment but in their prevention through teaching and (more important) making it possible for the poor to secure the food they must have.

RUFFIN, J. M. *The Diagnosis and Treatment of Mild Vitamin Deficiencies*. J.A.M.A. 117, 18:1493 (Nov. 1), 1941.

**Cultivating a Neglected Field**—Postpartum care carried on for one year for 600 obstetric cases proved its value in preventing and treating sequelae of delivery. Child hygienists especially will be interested in the findings.

SEWALL, C. W., and MULLANEY, O. C. *Postpartum Care: Preliminary Report on Studies in a Follow-up Clinic*. New Eng. J. Med. 225, 20:777 (Nov. 13), 1941.

**The Tuberculous After Three, Five, Ten Years**—Thanks to annual physical examinations 62 per cent of the employees having tuberculosis were detected while in the minimal stage. Only 1.5 per cent of these minimal cases died, whereas a fifth of the moderately advanced cases and nearly half the far advanced cases died. Of the minimal cases that returned to work, three-quarters had been cured in a year



or less. Of the advanced cases, a third were cured after three years or more.

STEPHENS, M. G. Follow-up of 1,041 Tuberculous Patients. *Am. Rev. Tuberc.* 44, 4:451 (Oct.), 1941.

**Mental Illness Can Be Prevented**  
—If you are one of those who enjoy an occasional sortie into some field of little immediate applicability to your present job, then I think you'll like this series of papers on the Delaware "Human Relations Classes" in which a classroom teacher leads the children to a clearer understanding of themselves and to better mental health.

TARUMIANZ, M. A. How the Human Relations Classes Were Started (and three related papers). *Understanding the Child* 10, 3:3 (Oct.), 1941.

**Clamping Down on Hash Houses and Juke Joints**—When 77,000 troops barge into a state for a month to carry out maneuvers, health problems multiply, as one may quite readily understand. What was done to minimize the worst health hazards is told all too briefly in this excellent report.

WILLIAMS, W. C., and MCGINNIS, G. F. *Pub. Health Rep.* 51, 43:2065 (Oct. 24), 1941.

## BOOKS RECEIVED

**EYE HAZARDS IN INDUSTRY.** By Louis Resnick. New York: Columbia University Press, 1941. 321 pp. Price, \$3.50.

**COMMUNITY HYGIENE.** By Dean Franklin Smiley and Adrian Gordon Gould. 3d ed. New York: Macmillan, 1941. 448 pp. Price, \$2.50.

**GYNECOLOGY AND FEMALE ENDOCRINOLOGY.** By Emil Novak. Boston: Little, Brown, 1941. 605 pp. Price, \$10.00.

**OCCUPATIONAL DISEASES. Diagnosis, Medico-legal Aspects and Treatment.** By Rutherford T. Johnstone. Philadelphia: Saunders, 1941. 558 pp. Price, \$7.50.

**TREATMENT OF THE PATIENT PAST FIFTY.** By Ernst P. Boas. Chicago: Year Book Publisher, 1941. 324 pp. Price, \$4.00.

**COSMETIC DERMATOLOGY.** By Herman Goodman. New York: McGraw-Hill, 1936. 591 pp. Price, \$6.50.

**PNEUMOCONIOSIS (SILICOSIS), THE STORY OF DUSTY LUNGS. A PRELIMINARY REPORT.** By Lewis Gregory Cole and William Gregory Cole. New York: John B. Pierce Foundation, 1940. 290 pp. Free—apply direct to Foundation.

**THE ANAEROBIC BACTERIA AND THEIR ACTIVITIES IN NATURE AND DISEASE. A SUBJECT BIBLIOGRAPHY. Supplement One, Literature for 1938 and 1939.** By L. S. McClung and Elizabeth McCoy. Berkeley: University of California Press, 1941. 244 pp. Price, \$3.50.

**THE VALUE OF HEALTH TO A CITY. Two Lectures Delivered in 1873 by Max Von Pettenkofer. Translated by Henry E. Sigerist.** Baltimore: John Hopkins, 1941. 52 pp. Price, \$1.00.

**FACTS ABOUT NURSING, 1941.** By the Nursing Information Bureau of the American Nurses Association, 1941. 57 pp. Price, \$.25.

**CASES OF SYPHILIS UNDER TREATMENT.** Cuyahoga County, March, 1940. By Howard Whipple Green. Cleveland: Joint Social Hygiene Committee, 1941. 51 pp.

**ACTIVE CARBON. THE MODERN PURIFIER.** By John W. Hassler. New York: Industrial Chemical Sales Division, West Virginia Pulp and Paper Co., 1941. 159 pp. Apply direct to publisher.

**GOOD TIMES WITH OUR FRIENDS.** By Dorothy Baruch, Elizabeth Montgomery and William S. Gray. New York: Scott, Foresman & Co., 1941. 128 pp. Price, \$.64.

## ASSOCIATION NEWS

### APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

#### *Health Officers Section*

B. Randolph Allen, M.D., M.P.H., Box 95, Suffolk, Va., Health Officer  
Myron J. Barker, M.D., Vernon Parish Health Unit, Leesville, La., Director  
Clayton C. Benjamin, M.D., M.S.P.H., 124 S. Maple, Manistique, Mich., Acting Director, Alger Schoolcraft Health Dept.  
Mildred E. Burton, M.D., Owsley County Health Dept., Booneville, Ky., Director of Public Health  
Albert S. J. Clarke, M.D., M.P.H., Drew County Health Dept., Monticello, Ark., Medical Director  
William N. Dawson, M.D., M.P.H., Ruth St., Maryville, Tenn., Health Director, Blount County Health Dept.  
J. W. Duke, M.D., Knott County Health Dept., Hindman, Ky., Director  
Edwin N. Hesbacher, M.D., Warren County Health Dept., McMinnville, Tenn., Director  
J. McIver Jackson, M.D., Prince William-Stafford Health Dist., Manassas, Va., Health Officer  
Roscoe C. Kash, M.D., M.P.H., Wilson County Health Dept., Lebanon, Tenn., Director  
Seth W. Kellam, M.D., Box 553, Midland, Tex., Director, Midland-Ector County Health Unit  
William R. Kelsay, Jr., M.D., Wayne County Health Dept., Monticello, Ky., Health Officer  
R. Bruce Mallett, M.D., Box 326, Orange, Va., Orange County Health Officer  
William Gregory Morgan, M.D., Daviess County Health Dept., Owensboro, Ky., Director  
William Bruce Nelson, M.D., County Health Dept., Bay Minette, Ala., Baldwin County Health Officer  
John H. Pasek, D.O., Mono County Hospital, Bridgeport, Calif., Health Officer  
William P. Parker, M.D., County Court House, Nashville, Tenn., Asst. Health Officer, Davidson County Dept. of Health  
R. Mel Perry, M.D., Sevier County Health Dept., Sevierville, Tenn., Director  
Thomas Scarlett, M.D., 234 E. Market St.,

Harrisonburg, Va., Health Officer, Rockingham County Health Dept.

Charles P. Stevick, M.D., Box 96, Beaufort, N. C., Acting Health Officer, Carteret County Health Dept.

Murray P. Wichard, M.D., District Health Officer, Cherokee, Clay, Graham Health District, Murphy, N. C.

#### *Laboratory Section*

Howard L. Bodily, Ph.D., 1392 University Ave., Berkeley, Calif., Assoc. Bacteriologist U. S. Public Health Service  
Mary P. Clapp, M.S., 6004 Greene St., Germantown, Philadelphia, Pa., Supervising Technician, Div. of Pneumonia Control, State Dept. of Health  
Sophia M. Cohen, B.S., Div. of Labs. & Research, New Scotland Ave., Albany, N. Y., Asst. Bacteriologist, New York State Dept. of Health  
Richard C. Neale, M.D., 1016 W. Franklin St., Richmond, Va., Director, Physicians' Service Laboratories  
Erwin Neter, M.D., Children's Hospital, Buffalo, N. Y., Assoc. Attending Bacteriologist  
Lieut. Frederick B. Thompson, Jr., 4th Corps Area Lab., Fort McPherson, Ga., Sanitary Chemist  
Joseph S. Zellat, Ph.D., Arizona State Laboratory, Tucson, Ariz., Asst. Bacteriologist, U. S. Public Health Service

#### *Engineering Section*

Herman K. Clark, P. O. Box 1496, Corpus Christi, Tex., Regional Sanitary Engineer, State Dept. of Health  
Steven W. Nichiporuk, B.S., 737 S. Wolcott St., Chicago, Ill., Asst. Sanitary Engineer, Cook County Public Health Unit  
Lee T. Purcell, Pompton Lakes, N. J., Analyst and Sanitary Engineer, New Jersey Dist. Water Supply Commission

#### *Food and Nutrition Section*

Marjorie Grant, M.A., 620 S. Third St., Louisville, Ky., Nutrition Consultant, State Health Dept.

Jerald G. Wooley, M.D., Selkirk Court, Bannockburn Heights, Bethesda, Md., Bacteriologist, National Institute of Health

*Maternal and Child Health Section*

Mildred A. East, B.S., 2370 Clermont St., Denver, Colo., Inspector of Hospital and Maternity Homes, State Board of Health  
Dorothy T. Pearce, Ph.B., M.A., Bureau of Maternal & Child Welfare, Health Dept., Washington, D. C., Supervisor of Medical Social Workers

*Public Health Education Section*

Hazel A. Hart, 105 E. 22nd St., State Charities Aid Assn., New York, N. Y., Field Secretary  
Valeria McDermott, Ph.B., 5802 Blackstone Ave., Chicago, Ill., Supervisor, Educational Unit, Chicago Health Dept.  
Morris Sussman, A.B., 189 Ponce de Leon Ave., San Juan, Puerto Rico, Director of Youth Personnel, National Youth Administration  
Lester Taylor, M.D., 10515 Carnegie Ave., Cleveland, Ohio, President, Cleveland Health Museum  
Netta W. Wilson, M.A., 4524 Edmund Blvd., Minneapolis, Minn., Writer on Dental Health Staff, State Dept. of Health

*Public Health Nursing Section*

E. Nora Blixt, 18400 Ilene Ave., Detroit, Mich., Public Health Nurse, Dept. of Health  
Edith F. Colbert, R.N., M.A., Franklin-Gulf County Health Unit, Apalachicola, Fla., Staff Nurse  
Anita I. Discon, B.S., 4230 Vincennes Place, New Orleans, La., Director, Hygiene and Home Nursing, New Orleans Chapter, American Red Cross  
Virginia Ford, R.N., General Delivery, Fort Huachuca, Ariz., Public Health Nurse  
Bess Hair, R.N., 661 Mulberry Ave., Clarksburg, W. Va., Harrison County Health Nurse  
Agnes H. Haygarth, R.N., 1241 King St. West, Hamilton, Ontario, Canada, Director, Public Health Nursing, Dept. of Health  
Mary L. Hewitt, R.N., Ridgecrest Ave., Box 271, Rutherfordton, N. C., Supervising Nurse, Rutherford-Polk Dist. Health Dept.

Adeline H. Hunt, R.N., Neighborhood League, Wayne, Pa., Public Health Nurse-in-Charge  
L. Adelia Martin, R.N., B.A., Box 654, Carthage, Tex., County Health Nurse, Panola County Nursing Service

Mary P. Oliver, B.S., Cherokee-Clay-Graham Health Dist., Robbinsville, N. C., Public Health Nurse

Jeanne E. Polk, R.N., Liberty County Health Dept., Liberty, Tex., Public Health Nurse

Louise C. Smith, R.N., M.S., Miller County Health Dept., Texarkana, Ark., Public Health Nurse, U. S. Public Health Service

Jeannette Snyder, B.N., M.A., 824 D. St., S.E., Washington, D. C., Supervisor, South East Nursing Office

*Epidemiology Section*

Philipp R. Rezek, M.D., Jackson Memorial Hospital, Miami, Fla., Pathologist

*Unaffiliated*

Neal E. Blanton, B.S., Cowlitz County Health Dept., Court House, Kelso, Wash., Sanitarian  
Curtis R. Chaffin, M.D., M.P.H., 816 Oregon Bldg., Portland, Ore., Acting Director, Div. of Mental Hygiene, State Board of Health  
Judson H. Clark, 627 W. Church St., Elmira, N. Y.

DECEASED MEMBERS

J. N. Baker, M.D., Montgomery, Ala. Elected Member 1930, Elected Fellow 1932, Health Officers Section

F. R. Dew, M.D., Oberlin, Ohio, Elected Member 1921, Elected Fellow 1923, Health Officers Section

R. Clifford Errickson, Long Branch, N. J., Elected Member 1937, Health Officers Section

Bernard Kohn, M.D., Philadelphia, Pa., Elected Member 1918, Elected Fellow 1923, Health Officers Section

Mrs. Frederick T. Lord, Boston, Mass., Elected Member 1912, unaffiliated

Charles Pecher, M.D., New York, N. Y., Elected Member 1938, Food and Nutrition Section

Roy C. Rehder, M.D., Mansfield, Ohio, Elected Member 1937, Health Officers Section

Ellen S. Stadtmuller, M.D., San Francisco, Calif., Elected Member 1929, Maternal and Child Health Section

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WANTED: The following issues of the *American Journal of Public Health*—April, 1911; February, 1937; January, 1938; February, 1939; July, 1941; and August, 1941. The American Public Health Association will be glad to pay postage for the *Journals*.

## EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearing house on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

### UNASSEMBLED EXAMINATIONS IN WEST VIRGINIA

The Merit System Council of West Virginia, Box 873, Morgantown, has announced that it is expected that unassembled examinations will shortly be given for the following positions in the West Virginia State Health Department.

<i>Position</i>	<i>Salary per month</i>
Chief of Medical Services.....	\$325-\$400
Ophthalmologist .....	275- 350
Director of County Health Work.....	350- 400
Director, Maternal & Child Hygiene.....	350- 400
Director, Communicable Diseases .....	350- 400
Director, Vital Statistics .....	350- 400
Director, Industrial Hygiene.....	350- 400
Assistant Director, Maternal & Child Hygiene.....	320- 375
Assistant Director, Communicable Diseases (Venereal).....	320- 375
Assistant Director, Tuberculosis.....	320- 375
Venereal Disease Consultant.....	320- 375
Senior Health Officer.....	320- 375
Junior Health Officer.....	280- 320
Health Officer Trainee.....	\$200

Residence in West Virginia has been waived in consideration of the applications for these positions. However, residents of the state may be given preference in making appointments. Complete information may be obtained by writing to the Merit System Council.

### VACANCY IN LOS ANGELES CITY HEALTH OFFICER POSITION

The City of Los Angeles is seeking qualified applicants for the position of City Health Officer paying a salary of \$7,200 per annum. While the city charter requires that candidates for this position be residents of the City of Los Angeles if possible, if insufficient competition for this examination is obtained, candidates who do not reside in the city may become eligible if they are otherwise qualified. From the experience of other agencies in this area it is probable that insufficient competition will be obtained and that it will be necessary to waive the residence requirements.

The City Health Officer is the Chief Administrative Officer of the City Health Department and plans and administers a broad public health program, including medical and inspectional services. He is responsible for the proper enforcement of health laws and ordinances and the prevention and control of communicable disease in the city.

Public health physicians who are interested in this position should communicate with the Los Angeles City Civil Service Commission, Room 11, City Hall, Los Angeles, California, for further information.

### U. S. CIVIL SERVICE COMMISSION

The Commission has announced that applications will be received for positions as Senior Medical Officer (\$4,600), Medical Officer (\$3,800), and Associate Medical Officer (\$3,200) for appointments in the Public Health Service, with the Food and Drug Administration, Veterans' Administration, and the Indian Service. Forms for application may be obtained from the U. S. Civil Service Commission, Washington.

Junior Public Health Nurse. A civil service examination for Public Health Nurse (\$2,000) has been open for some time. Nurses who have been unable to qualify for this examination because of the experience requirement now have an opportunity to

qualify through a new Junior Public Health Nurse examination (\$1,800) which requires no experience. Applications are also being received for examinations now open for Junior Graduate Nurse (\$1,620) and Graduate Nurse for general staff duty (\$1,800). Further information and application forms may be obtained at any first or second class post office or from the Civil Service Commission, Washington.

### POSITIONS AVAILABLE

Young woman, trained in Home Economics, for group contact work in behalf of an important commercial organization whose products are useful in the protection of public health and the National Nutrition Program. Experience in the public health field or related fields is essential. Office in New York, some travel involved. Write Box H, Employment Service, A.P.H.A.

Southern State Department of Health seeks physicians qualified by training and experience as County Health Officers or as Pediatricians. Write Box B, Employment Service, A.P.H.A.

Western State Department of Health will consider applications from physicians with experience and a degree in public health. Write Box S, Employment Service, A.P.H.A.

Physician with public health training to serve as full-time County Health Officer in rural South Atlantic area. Salary \$3,600 to \$4,000. Write Box C, Employment Service, A.P.H.A.

County Public Health Nurses for New Mexico. Must have four months' post-graduate instruction under one of the recognized public health nursing courses and one year's experience. Must drive and have a car. Address inquiry to State Health Department, Santa Fe, N. M.

Physician with either public health training or experience in local health department administration to serve as health director in a county health department in mid-western state. Salary \$4,000 and \$500 travel (flat rate). Well established department with offices in attractive little city of 10,000. Write Box T, Employment Service, A.P.H.A.

Laboratory Director—Bacteriologist—\$2,400. For combined hospital and health department laboratory with staff of 10 and visiting pathologist in charge of hospital aspects. Bacteriological experience and training especially desired. Opportunities for expanding program good. Reply Box G, A.P.H.A. Employment Service.

Wanted: Trained Public Health Nurse, starting salary \$1,500 per year and traveling expense, increase to \$1,700 within 6 months. Saginaw County Health Department, Saginaw, Mich.

The State Department of Social Security and Welfare, Crippled Children's

Division, of Phoenix, Ariz., has three vacancies to be filled. Examinations will soon be held for orthopedic nursing consultant, nurse-physical therapist, and medical social worker.

Further information may be obtained by writing to the Merit System Supervisor, Room 208, 128 North First Avenue, Phoenix, Arizona.

### PHYSICIANS WANTED IN CINCINNATI

Carl A. Wilzbach, M.D., Commissioner of Health of Cincinnati, has announced that there are vacancies for white male physicians, aged 23 to 50, graduates of recognized colleges of medicine, licensed to practise in Ohio, for appointment to the Cincinnati Health Department. Duties include surveillance over communicable disease, infant and child welfare work, medical service for sick poor, epidemiological surveys of communicable disease, examinations for work certificates, school teachers, etc., vaccination, medical school inspection. Salary \$2,640 to \$3,360 plus transportation allowance of \$240 per annum. Eligible for a retirement system. Persons interested should communicate with Dr. Wilzbach, Commissioner of Health, City Hall, Cincinnati, Ohio.

### PUBLIC HEALTH ENGINEER

Responsible professional public health engineering involving field investigations and office studies in the application of sanitary measures. The more difficult engineering and sanitation field surveys include supervision over public water supplies, sewerage systems and sewage treatment plants and review of plans for same, and promotion and supervision of sanitation programs. Minimum qualifications: Training and experience equivalent to 3 years' civil engineering experience, including 2 years in public health or sanitary engineering; or completion of an academic year of graduate study and a year's experience in sanitary or public health engineering; and graduation from a college of recognized standing with a major course in civil or sanitary engineering. The salary range is \$205 to \$250 per month depending upon experience. Apply Box E, Employment Service, A.P.H.A.

## POSITIONS WANTED

## ADMINISTRATIVE

Physician, M.D. Tulane, M.P.H. Johns Hopkins, age 31, experienced as health unit director, prefers administrative position in the South. A-488

Physician with M.P.H. from Johns Hopkins 1924, experienced as state director for communicable diseases, as county health officer and as director of field training center, will consider responsible position with good income. A-483

Dentist, University of Pittsburgh, D.D.S.; M.P.H. University of Pennsylvania 1941; experienced in practice, wishes an administrative position in public health, preferably at state level. M-450

## HEALTH EDUCATION

Teacher and research worker, man, Ph.D., age 52. Extensive record as college professor of biology and hygiene and investigator, for the past two years engaged in research. H-499

Woman with M.S. in public health, University of Michigan, and Ph.D. in health education, New York University, experienced in public schools, teachers colleges, and community public health, now employed as health teaching supervisor, will consider position in school, organization, or industry. H-236

Young woman with Master's degree in Health Education, Teacher's College, Columbia University, and background of clinical laboratory work and biochemistry, seeks position as health educator in research or as laboratory assistant in public health. H-494

Health Educator, Negro, man with background of High School administration and M.S.P.H. from University of Michigan, seeks position in Health Education. Public agency or educational field. Excellent references. H-497

Woman, M.S. in public health, excellent graduate training in education, 8 years' experience as business executive (sales and publicity). Just completed year's research in community education. Seeks good administrative position. H-496

Health Educator, M.A. in Education, 10 years' background in community organization for public health education, also teaching of personal and community health at high school and college levels. Public health nurse, able to teach mental and social hygiene as well as general health education. East preferred. H-498

Health Educator. Man with M.S. in preventive medicine and public health. Negro. Seeks position in Health Education or field work with official or non-official agency. H-500

Health Educator, man 32, M.S.P.H. with excellent training and varied experience in education and public health. Would expect salary of \$3,000. Prefers national or state organization. Excellent references. H-405

Woman with master's degree in health education, 12 years' successful experience in public school and college teaching, administration and research. Will consider position in normal school, public schools, or in official or nonofficial health agencies. Prefers South or East. Available at once. H-501

## LABORATORY

Milk Sanitarian and Technologist, age 37, Ph.D. Bacteriology, Wisconsin, 10 years' experience in milk and food sanitation from industrial and official angle, seeks administrative position with opportunity for research or investigational work preferred. L-381

Experienced Bacteriologist, man, 56, with long record as successful university teacher, research worker, and head of department of bacteriology and public health, desires new location in educational, research, or public health organization. Available at once. L-462

Chemist, Sc.D., Biochemistry, Johns Hopkins University. Age 31. Public health laboratory experience, teaching experience. Desires position with promise of advancement, preferably in commercial organization. L-461

Laboratory Director, unusually well qualified and experienced man, aged 41, Ph.D. with training at Michigan and Maryland. Excellent references. Will consider administrative, teaching or research position in public health. L-459

Experienced bacteriologist, young man of 33, Sc.B., who for several years has been in charge of state laboratory doing public health and diagnostic bacteriology, immunology and serology, will consider opening. L-427

## SANITARY ENGINEERING

Engineer, age 38, 3 years' experience as district sanitary supervisor, state department of health, together with work on plumbing, heating and ventilation. Will consider position in the plumbing or heating field or state department of health. Prefers middle western or western states. E-453

Public Health Engineer, M.S. Harvard, experienced in public health and industrial hygiene, wishes position of better sort in public health engineering or industrial hygiene. E-470

Public Health Engineer, M.S. Harvard, with more than 10 years' experience including 5 years with state division of sanitation, is available. E-468

#### STATISTICAL

Public Health Statistician. Young man, M.S.P.H. Michigan, now employed as supervisor of state health project, experienced in medical research, epidemiology studies and vital statistics, seeks position in city or state health department in Midwest. S-458

Woman with academic, business and research experience in vital statistics, seeks a position in the vital statistics division of a state or city health department, preferably as registrar. S-459

Experienced and well trained public health nurse, with background of tuberculosis, venereal disease, school, industrial, and generalized services, will shortly be available for appointment. Three years as director of state nursing service. Experienced as university teacher of public health nursing. M.A., New York University. M-449

## Opportunities Available

**PUBLIC HEALTH PHYSICIANS**—(a) Physician qualified to serve as chief of Bureau of Medical Service, state health department; \$400-\$440; East. (b) Epidemiologist for key appointment in eastern city; administrative experience in health department required; \$3,800-\$4,800. (c) Director, department of health and physical education; school system of midwestern metropolis, \$5,000-\$6,000. (d) Health commissioner; physician under 40 with considerable public health training required; full-time appointment; \$4,200. (e) Physician with background in public health desiring training in social hygiene; social hygiene division of municipal health department; unusual opportunity for training in epidemiological aspects venereal disease control, \$2,400-\$3,300. (f) Rural health officer; must be interested public health; but training unnecessary; \$225-\$300; South. (g) Young physician for public health appointment offering accredited training in public health obstetrics; minimum year's training obstetrics required; \$150, travel allowance. (h) City physician; southern community of 25,000; southerner preferred. PH1-1, Medical Bureau (Burnice Larson, Director) Palmolive Building, Chicago.

**STUDENT HEALTH PHYSICIANS** — (a) Woman physician for immediate appointment to student health department, college for women; enrollment over 2,000; woman under 40 with teaching experience preferred; \$2,100, partial maintenance; nine-month term. (b) Young man particularly interested health education, qualified to assist in surgery, for student health appointment in exclusive small college; \$3,600; two out of three summers free. PH1-2, Medical Bureau (Burnice Larson, Director) Palmolive Building, Chicago.

**CHIEF SANITARIAN**—Young man with college degree (preferably in engineering) and postgraduate training public health, plus three-five years' field experience required; appointment is with

district health department, midwestern county; \$2,400, travel allowance; headquarters in college town. PH1-3, Medical Bureau (Burnice Larson, Director) Palmolive Building, Chicago.

**BACTERIOLOGISTS** — Appointments available with large pharmaceutical house for technicians trained in biochemistry and bacteriology, Master's degree or equivalent desirable, but not required. PH1-4, Medical Bureau (Burnice Larson, Director) Palmolive Building, Chicago.

**PUBLIC HEALTH NURSES**—(a) Maternal and child health advisory nurse; duties include assisting supervising nurses in organized health units to develop their maternal and child health program; degree, certificate public health nursing, postgraduate training either obstetrics or pediatrics required; \$195, travel allowance. (b) Orthopedic field nurse; certificate public health nursing, postgraduate training orthopedics required; duties consist of giving direct service to crippled children in unorganized areas; \$165, liberal daily allowance while in field. (c) Staff nurse for state health department; public health nursing certificate required; \$135-\$160, travel allowance, mileage; West. (d) Public health nursing supervisor; minimum year's public health training, followed by two years' public health experience required; \$1,920, mileage. (e) Public health nurse; small New England community; public health nursing certificate required; \$1,800. (f) Student health nurse; duties include supervision of both out-patient and in-patient departments of student health service, eastern university; supervising experience required; \$1,300-\$1,400, maintenance, for school year. (g) Out-patient department supervisor; degree, background of experience essential; public health training desirable; must be qualified to reorganize and supervise out-patient department of university hospital; \$2,000, partial maintenance. PH1-5, Medical Bureau (Burnice Larson, Director) Palmolive Building, Chicago.

## Situations Wanted

**PUBLIC HEALTH PHYSICIAN**—B.S., M.D. degrees, state university; M.P.H., Johns Hopkins; four years, director of county health unit; recommended as highly skilled man in field of public health theory and administration. PH1-6, Medical Bureau (Burnice Larson, Director) Palmolive Building, Chicago.

**PUBLIC HEALTH NURSE**—Graduate of fairly large training school; B.S. in nursing, University of Washington; certified public health nurse; eight years, city and county health work; two years, director of nurses, child welfare organization;

most recent appointment, consultant nurse in state department of health. PH1-7, Medical Bureau (Burnice Larson, Director) Palmolive Building, Chicago.

**BACTERIOLOGIST** — A.B., M.A., midwestern university, bacteriology major; Ph.D., Yale, major immunology, minors public health, physiology; five years in charge of laboratory, large industrial company; no preference as to locality. PH1-8, Medical Bureau (Burnice Larson, Director) Palmolive Building, Chicago.

## NEWS FROM THE FIELD

### THE NEW YORK ACADEMY OF MEDICINE ON "PLAIN WORDS ABOUT VENEREAL DISEASE"

THE Committee on Public Health Relations of the New York Academy of Medicine released the following statement on December 1:

The Committee . . . is seriously concerned with the information contained in *Plain Words about Venereal Disease*, by Dr. Thomas Parran and Dr. R. A. Vonderlehr that, despite the recent availability of better methods of treatment and prevention of gonorrhea and syphilis, the disease rates among the troops have been mounting during the year 1941. Irrespective of whether or not this claim is supported by the monthly venereal disease statistics for the current year which have not yet been released by the Surgeon General of the Army, the Committee on Public Health Relations is concerned that the controversy in Washington with regard to the propriety of publishing "Plain Words" may obscure the most important point at issue in this publication.

The reported attitude of some responsible military and civil officials in regard to the toleration and attempted regulation of commercialized prostitution in the vicinity of troop concentrations presents serious public health implications. Quite aside from the social and moral aspects of commercialized prostitution and the bribery, corruption and white slavery which it breeds, past experience has demonstrated that the medical examination of prostitutes is an untrustworthy method of venereal disease prevention and that organized prostitution, however regulated, is responsible for a large share of venereal disease among soldiers. One of the greatest triumphs of preventive medicine was accomplished by the celebrated General Order No. 77 issued by Pershing upon the advice of Dr. Hugh H. Young and Surgeon General Merritte W. Ireland to all commanders of troops in the AEF, which resulted in the lowest venereal disease rate ever recorded by any army up to that time. In view of this demonstration and the studies by Raymond Fosdick and Abraham Flexner, it is surprising that there are still any medical and lay advocates of the discredited method of so-called regulation of commercialized prostitution.

Commercialized prostitution is not officially approved or tolerated by responsible civil and military authorities in the State of New York, but we must nevertheless be concerned about the health and welfare of our young men in military service or in essential war industries in some other parts of the country.

In spite of the fact that communicable disease observes no state or local boundaries, there are still advocates for local option in the vicinity of military concentrations. Under the May Act passed by Congress in July 1941, the elimination of prostitution in the vicinity of military establishments is the law of the land. In this time of national peril, the protection of our military forces against the communicable diseases is of paramount importance.

The Committee on Public Health Relations of the New York Academy of Medicine wishes to record its opinion that commercialized prostitution still constitutes a most serious health hazard and that so-called regulation of prostitutes is thoroughly untrustworthy as a method of venereal disease control. The committee therefore endorses the major thesis of "Plain Words" by Drs. Parran and Vonderlehr and urges that the May law be invoked by the military authorities in localities adjacent to military concentrations whenever the U. S. Public Health Service and the new Division of Social Protection of the Federal Security Agency certify that they have been unable to persuade the responsible civil authorities to take effective action.

### SUPPRESSION OF PROSTITUTION IN ARMY CAMPS

AMONG a number of resolutions which have grown out of the current controversy relating to the prevalence of venereal disease in the vicinity of army camps and with respect to the enforcement of regulations, especially the enforcement of the May Act by the Secretaries of War and of the Navy, are those from the Public Health Council of the State of New York and the Board of Managers of the New York State Charities Aid Association which are presented herewith.

Resolution passed by the Public



Health Council, New York State,  
November 28, 1941:

WHEREAS, published reports indicate commercialized prostitution exists in the immediate vicinity of certain of the military establishments of the United States with alleged official reliance upon "regulation" of houses of prostitution, including the medical examination of prostitutes, as an aid in preventing the spread of venereal diseases, and

WHEREAS, this method has been proven many times in the past not only valueless but conducive to a false sense of security on the part of the public, thereby leading to increased exposure and increased venereal disease, and

WHEREAS, despite modern advances in diagnostic methods, a like result is as inevitable now as in the past, since a medical certificate of freedom from evidence of infection issued to a commercialized prostitute can apply only to the moment at which the examination was made, and can give no assurance whatever of freedom from infection immediately thereafter, and

WHEREAS, the State of New York has at considerable expense for several years conducted an intensive program for the prevention and reduction of venereal diseases, and with such apparent success that the rate of newly acquired syphilis has been reduced by more than half in the past four years, and the rate of rejections by Selective Service Boards on account of the venereal diseases has been much below that of the country as a whole and markedly below that of many of the states to which many residents of New York State have been sent for military training, and

WHEREAS, the Public Health Council has a proper concern for the health of the residents of the State who have been inducted into military service and is justifiably apprehensive lest the important gains of recent years be seriously jeopardized by the exposure of men in such service to venereal infections, and

WHEREAS, in the opinion of the Public Health Council, so-called "regulated" prostitution, including the medical examination of prostitutes, is as dangerous now as it has been in the past and will wherever practised lead to increased exposure and increased venereal infection, therefore be it

RESOLVED, that in view of the national interest involved, there should be a clearly stated policy established by the high command directing every local commander to take all proper means at his disposal to suppress commercialized prostitution in the

vicinity of military establishments and to cooperate actively with civil authorities in effectuating this objective rather than leaving the decision as to policy in this respect to the discretion of individual commanders, and be it further

RESOLVED, that the Secretary send a copy of this resolution to the President of the United States, the Secretary of War, the Secretary of the Navy, the Director of Defense Health and Welfare Services, the Chief of Staff of the Army, the Chief of Naval Operations, the Surgeons General of the Army, the Navy, and the Public Health Service, the Chairmen of the Committee on Military Affairs of the House of Representatives and of the Senate, and the Members of Congress from the State of New York.

Resolution adopted by the Board of Managers, State Charities Aid Association, December 12, 1941:

WHEREAS, during the first World War a law was enacted by which the Army and Navy Departments were given authority to eliminate prostitution in areas adjacent to military and naval camps and establishments, which law was carried into effect by the Army and Navy authorities with aid from local authorities, if available, with excellent effects as indicated by an unusually low infection rate of venereal diseases in the United States Army, and

WHEREAS, a similar bill introduced in Congress was approved and urged by this Board at its meeting in February, 1941, and subsequently became law, and

WHEREAS, it is currently reported that the Army authorities have not proceeded to enforce the May Act, and that the infection rate from venereal diseases in the present Army is very considerable, therefore

RESOLVED, that the Board of Managers of the State Charities Aid Association, on the recommendation of its Committee on Tuberculosis and Public Health, respectfully urges the authorities of the War and Navy Departments to make full use of the provisions of the May Act in all localities in which there is need therefor, and to indicate to all commanding officers of military and naval establishments that it is the settled policy of the Army and Navy that prostitution in areas near such establishments must be suppressed as a measure of protection of the health and efficiency of the American Army and Navy, and directing them to take all appropriate steps toward that result.

A MESSAGE FROM THE LATIN AMERICAN  
DELEGATION AT THE 70TH ANNUAL  
MEETING

**S**PEAKING for the Latin American Delegation at a luncheon meeting of the American Public Health Association in Atlantic City, N. J., October 17, 1941, Dr. J. C. Mussio-Fournier, the Minister of Public Health of Uruguay, expressed appreciation for the generous hospitality of the Pan American Sanitary Bureau and of its Director, Dr. Hugh S. Cumming. He expressed appreciation also to the American Public Health Association for having made possible the invitation to attend the 70th Annual Meeting and he congratulated the officers of the Association on the success of the meeting.

Continuing, Dr. Mussio-Fournier said:

The significance of this Congress is greater than that of a simple scientific meeting. America today is an oasis of peace in the midst of the most frightful storm through which humanity has passed. The same malignant forces which have trampled underfoot the rights and treasures which have been slowly accumulated in Europe is hovering as a terrible menace over the new world. Fortunately, America has reacted as one man in the face of the greatest danger which the continent has known since the Homeric days of her glorious independence.

Today at this important meeting there has been drawn up the first program for the sanitary and public health defense of the hemisphere. The Minister of Defense of Cuba, the Honorable Dr. Domingo F. Ramos, has contributed to our discussion a collaboration as complete as it is valuable.

America loves peace, but America loves liberty still more. The period of projects and discussions must end. The hour for resolution is at hand: rapid resolution, energetic resolution. All our moral and material forces must be rapidly blended into a single formidable defense. Only thus can we make of our America a fortress against which the fist of the aggressor may beat in vain. Our governments continue to maintain the diplomatic status of neutrality. But our peoples are fervent and enthusiastic adherents of the great English democracy which, with an epic resistance, perhaps heretofore unknown in the history of the world, is offering up even the last

drop of its blood to preserve the liberty of conscience, the most precious moral treasure which civilized man has enjoyed.

This precious treasure will be saved, thanks to the generous and formidable aid which this great democracy of the North is so disinterestedly lending to the cause of civilization, as the result of the energetic and outstanding resolution of its great President, Franklin Delano Roosevelt. You may be sure that if events require it, the descendants of those great patriots, Bolivar, San Martin, Artigas, Sucre, O'Higgins, Juarez y Marti, and their glorious brothers in the struggle for independence, will also offer their blood in the immortal cause of liberty.

SOUTHERN BRANCH A.P.H.A. MEETS  
IN ST. LOUIS

**A** SUCCESSFUL meeting of the Southern Branch of the American Public Health Association was held in St. Louis, Mo., November 10-13, in the Municipal Auditorium. A program of general sessions and sessions of the Public Health Nursing Section and the Sanitation Section were well attended.

Organized in November, 1932, the Southern Branch has now held ten meetings, providing an opportunity for those in 17 southern states to share their public health experience and information. The Branch has met concurrently with the Southern Medical Association and its Public Health Section.

The Southern Branch has elected the following officers for the ensuing year:

- President*—P. E. Blackerby, M.D., Louisville, Ky.
- First Vice-President*—D. L. Cannon, M.D., Montgomery, Ala.
- Second Vice-President*—Mrs. Ruth George, Columbia, S. C.
- Third Vice-President*—L. M. Clarkson, Atlanta, Ga.
- Secretary-Treasurer*—R. H. Hutcheson, M.D., Nashville, Tenn.

The Engineers' Section of the Southern Branch has elected the following officers:

- Chairman*—C. H. Field
- Vice-Chairman*—R. E. Dorer
- Secretary-Treasurer*—J. L. Robertson, Jr.

At the meetings of the Governing Council of the Southern Branch it was reported that 16 states in the territory of the Southern Branch had appointed Membership and Attendance Committees to promote membership in the parent organization and in the Southern Branch. It was decided to redraft the Constitution and By-Laws to include all amendments and to provide that representation on the Governing Council from each of the southern states would be contingent upon each state paying the annual dues of \$10.

The Governing Council provided a plan under which it is hoped that the Secretary of the Southern Branch can attend the forthcoming meeting of the Western Branch, and an invitation was extended to the Secretary and other officers of the Western Branch to be in attendance at future meetings.

The Public Health Nursing Section of the Southern Branch presented a request that in future meetings provision be made so that the Nursing Section might meet at some time other than the first or last days of the meetings of the Southern Medical Association.

Selected papers from the scientific program of the Southern Branch are before the Editorial Board of the *American Journal of Public Health*, and it is expected that several will be carried in the pages of the *Journal* during coming months.

#### THE NATIONAL SCIENCE FUND OF THE NATIONAL ACADEMY OF SCIENCES

THE National Academy of Science, with offices in Washington, D. C., has announced the establishment in April, 1941, of the National Science Fund. The Academy will receive and the National Science Fund will apply large or small gifts for all physical and biological sciences. The Fund also offers its services as adviser to any prospective donor to science.

The National Academy of Science

was incorporated by Act of Congress, signed by Abraham Lincoln on March 3, 1863. The Academy is the official scientific adviser to the government and is in touch with scientific developments in the United States and other countries. It has an organization for reaching and consulting any special group of scientific investigators. Its membership now includes 324 leaders in all branches of physical and biological science, elected in recognition of highly distinguished achievements in scientific research.

In 1916 the Academy established the National Research Council primarily to coordinate the non-governmental scientific and technical resources of the country with the military and naval agencies in the interest of national security and preparedness. At the end of the war the Council was reorganized as a permanent organization for the promotion and maintenance of scientific research. Its membership is largely composed of appointed representatives of the major scientific and technical societies of the country and includes business men interested in engineering in industry.

With a view to setting up a single national center especially designed to advise donors to science and to assure them that their funds will be conserved and expended wisely and fruitfully, the National Science Fund has been created. Offices of the Fund are at 515 Madison Avenue, New York, N. Y. A brochure, *Philanthropy in Science*, can be obtained from the Fund on request.

#### NURSING SERVICES IN INDUSTRY

ON November 23, the Committee To Study the Duties of Nurses in Industry, from the Public Health Nursing Section, American Public Health Association, met in New York City to discuss the further conduct of the study which is being made in cooperation with the Division of Industrial Hygiene, National Institute of Health. Beside

the members of the committee, representatives from industrial nurses associations in Western Massachusetts, New York City, New Jersey, Connecticut, Indiana and Delaware attended the meeting.

Consideration was given to revisions of the form used for the preliminary study and the committee voted to enlarge its membership by inviting representatives from the American Nurses Association, and from the National League of Nursing Education. It is planned to establish a group composed of representatives from the American Association of Industrial Physicians and Surgeons, the American Industrial Hygiene Association, the American Medical Association Council on Industrial Health, the National Conference of Governmental Industrial Hygienists, and the National Association of Manufacturers' Committee on Healthful Working Conditions. It is expected that the study will get under way in January, 1942, and will require approximately one year to complete.

#### INDUSTRIAL HYGIENE STATE PROGRAMS

THE National Institute of Health has announced that with the completion of a new building to house its offices and laboratories by mid-January, the Arkansas State Board of Health is planning to begin an industrial hygiene program authorized by the state's occupational disease law adopted by referendum last November. The U. S. Public Health Service will lend the Board of Health a doctor, an engineer, and a chemist.

The Maryland State Department of Health under a law passed in 1939 has recently established a Division of Industrial Hygiene and allotted \$10,500 for industrial hygiene activities during the state's current fiscal year. It is expected that the state will employ a physician as director for the new division and the Division of Industrial

Hygiene of the National Institute of Health will lend an engineer and a chemist.

#### SURVEY OF MEDICAL SERVICES IN INDUSTRY

THE Division of Industrial Hygiene of the National Institute of Health, Bethesda, Md., has announced that the nation-wide survey of medical service facilities in industry which is being directed by W. J. McConnell, M.D., of the Metropolitan Life Insurance Company, in his capacity as Consultant to the U. S. Public Health Service is now in its preliminary stage. At present Dr. McConnell is surveying a number of industries in Pennsylvania to determine whether the proposed procedure and form for recording the data are adequate for the purposes of the survey.

#### NATIONAL DEFENSE IN INDUSTRIAL HYGIENE

IT has been reported that during the current year the research section of the Division of Industrial Hygiene of the National Institute of Health has a program of which 90 per cent pertains to national defense. More than 125 research projects have been undertaken and at present 91 are under way. These studies concern the toxicology of organic and inorganic substances, industrial pathology and bacteriology, analytical methods and services, problems of aviation medicine, and physics. Twenty-five additional problems have been outlined for investigation in the near future. Particular emphasis has been placed on studies of the toxicity of explosives, solvents, metals used in airplane and munitions manufacture, and components of synthetic rubbers and plastics.

#### SOUTHERN BRANCH, A.P.H.A., MEMORIALIZES DR. J. N. BAKER

THE following resolution was unanimously adopted by the Governing Council of the Southern Branch, Ameri-

can Public Health Association, at its 10th Annual Meeting in St. Louis, Mo.

WHEREAS, on the death of Dr. J. N. Baker on November 9, 1941, the South has lost one of its ablest physicians, one of its most distinguished state health officers, and one of its finest gentlemen, and

WHEREAS, Dr. Baker exemplified the highest order of Southern culture, sportsmanship, gentleness, consideration for others combined with constructive leadership in pioneering progressive public health procedures, therefore be it

RESOLVED, that the Southern Branch of the American Public Health Association record its profound sense of loss in the death of Dr. Baker, and be it further

RESOLVED, that a copy of these resolutions be sent to Mrs. J. N. Baker, the Secretary of the Alabama State Medical Association and the Secretary of the American Public Health Association, and be it further

RESOLVED that a copy of these resolutions be spread upon the Minutes of the Southern Branch of the American Public Health Association.

#### DOROTHY DEMING RESIGNS AS GENERAL DIRECTOR, N.O.P.H.N.

GRACE ROSS, R.N., of Detroit, President of the National Organization of Public Health Nursing, has announced that the resignation of Dorothy Deming, R.N., as General Director has been accepted effective January 1, 1942. Miss Deming had requested to be relieved in October, 1940, and again in March, 1941. In accepting her resignation the Board expressed its indebtedness to Miss Deming for her 14 years of devoted service, during several years of which she edited *Public Health Nursing*, later becoming General Director.

#### RUTH HOULTON APPOINTED GENERAL DIRECTOR N.O.P.H.N.

ANNOUNCEMENT has been made of the appointment of Ruth Houlton, R.N., as General Director of the National Organization of Public Health Nursing, effective January 1, 1942, on the resignation of Dorothy Deming, R.N. Miss Houlton has been with the

N.O.P.H.N. since 1935, coming from the Visiting Nurse Association in Minneapolis. She has been Associate Director of the N.O.P.H.N. for the last 6 years.

#### U. S. INDIAN SERVICE HOLDS REGIONAL MEDICAL MEETING

A DISTRICT medical meeting of the U. S. Indian Service for California, Nevada, and Utah, was held in November at Reno, Nev. Participating in a program which included national defense, tuberculosis management, the control of trachoma, problems in nutrition, health education, and other clinical subjects, were about 20 physicians of the Service under Dr. Ralph B. Snively, District Medical Director. Other speakers included Fred T. Foard, M.D., Surgeon U. S. Public Health Service, San Francisco; David Holladay, M.D., of the California Department of Public Health; O. C. Moulton, M.D., President of the Nevada Tuberculosis Association; Mrs. Christie A. Thompson, State Supervisory Nurse, Reno, Nev., and W. W. White, Sanitary Engineer of the Nevada State Health Department, Reno.

#### FAMILY-COMMUNITY PROJECT OF ADDISON, MICH.

THE Family-Community Project of Addison, Mich., has been announced for this rural community under the sponsorship of Albion College to begin January 1, 1942. An annual grant of \$10,000 has been made by the Kresge Foundation, and Dr. Regina Westcott Wieman, psychologist and social counsellor, has been appointed director. The project will be related to two courses in human relations and social technics in the Albion College curriculum.

President John L. Seaton of Albion College, referring to the tremendous stresses and strains on family relationships which the present period has

brought, has pointed out that the family is the social unit which can make for a more abundant American life. The Addison workshop, in combination with the courses in social technics conducted during the evenings, will be open to professional workers already engaged in health or community work.

#### AMERICAN RED CROSS ENROLLS MEDICAL TECHNOLOGISTS

AS of November 30, 1941, the American Red Cross in Washington announced that a total of 3,180 medical technologists of various sorts had been registered, of whom 286 were chemical laboratory technicians, 202 dental hygienists, 219 dieticians, 408 laboratory technicians and 219 x-ray technicians.

Enrollment is still open for persons in various grades.

#### A.P.H.A. ANNUAL MEETING BADGES

THE Army Medical Museum, Washington, D. C., would like to receive a collection of badges representing any past meeting of the American Public Health Association. At the request of Dr. Harry A. Davis, Major U.S.A. Retired, this request is given publicity in the thought that some member may wish to donate to the Museum a collection of these badges.

The Museum has recently added to its collection a medal commemorating the 50th Anniversary of the Association and the 100th birthday of Dr. Stephen Smith, founder, as well as a replica of the Sedgwick Memorial Medal.

#### ASSOCIATION OF SCHOOLS OF PUBLIC HEALTH

THE newly organized Association of Schools of Public Health held its first Annual Meeting in New York City December 20. Institutions holding membership in the Association are Columbia, Harvard, Johns Hopkins, Michigan, North Carolina, and Toronto. Lowell J. Reed, Ph.D., of Johns Hopkins, has

been President, Milton J. Rosenau, M.D., of North Carolina, Vice-President, and Henry F. Vaughan, Dr.P.H., of Michigan, Secretary.

#### SOCIAL HYGIENE DAY

THE American Social Hygiene Association announces that the Sixth National Social Hygiene Day will be observed on Wednesday, February 4, 1942. The theme is "Keep America Strong—Help Build Better Health."

The American Social Hygiene Association, 1790 Broadway, New York, N. Y., will provide advice and will suggest activities for coöperating groups.

#### PHYSICIANS NEEDED IN DEFENSE AREAS

DR. THOMAS PARRAN, Surgeon General of the U. S. Public Health Service, has announced that there is a need for physicians to practise in some defense areas. Physicians interested in securing further information should address Mr. George St. J. Perrott, National Institute of Health, Bethesda, Md.

#### STUDENTS OF PUBLIC HEALTH IN MICHIGAN

THE *News Letter* of the University of Michigan School of Public Health reports that at present there are 138 students pursuing the curriculum in public health at the University of Michigan. Nine of these students come from 7 foreign countries. The remaining 129 come from 30 states widely scattered. Michigan, Illinois, and Wisconsin have the highest representation—43 students are trainees.

#### ORAL HEALTH GROUP

THE Oral Health Group of the American Public Health Association has announced the election of Dr. C. R. Taylor of the Bureau of Public Health Dentistry, Michigan Department of Health, as its new *Secretary*, with Dr. A. O. Gruebel of Missouri as *Chairman*.

## MICHIGAN PUBLIC HEALTH ASSOCIATION

AT its recent Annual Meeting, the Michigan Public Health Association elected the following new officers to serve until November, 1942:

*President:* William R. Davis, D.D.S., Lansing

*President-elect:* Emilie G. Sargent, R.N., Detroit

*Vice-President:* B. H. Warren, M.D., Grosse Pointe

*Representative to A.P.H.A. Governing Council:* William R. Davis, D.D.S.

*Secretary-Treasurer:* Marjorie Delavan, Lansing

The society announces that its 22nd Annual Meeting will be held in Grand Rapids, November 11-13, 1942.

## IDAHO PUBLIC HEALTH ASSOCIATION

THE following new officers were elected by the Idaho Public Health Association at its second Annual Meeting held in October:

*President:* Dean John R. Nichols, Pocatello

*First Vice-President:* H. H. Rhodes, Coeur d'Alene

*Second Vice-President:* Mrs. R. L. Brainard, Wardner

*Third Vice-President:* Mrs. Otto Leuschel, Lewiston

*Fourth Vice-President:* Mrs. Emma Clouche, Twin Falls

*Fifth Vice-President:* A. H. Christiansen, Boise

*Secretary:* H. C. Clare, Boise

*Treasurer:* Lucy M. Higgins, Boise

L. J. Peterson was continued as the society's representative to the Governing Council of the A.P.H.A. and Fred T. Foard, M.D., of San Francisco was elected the first Honorary Member of the Idaho Public Health Association.

## ILLINOIS PUBLIC HEALTH ASSOCIATION

THE Illinois Public Health Association at its Annual Meeting held on December 4, 1941, elected the following officers for the coming year.

*President:* H. F. Babbitt, M.S.

*Vice-President:* W. D. Dotterrer, B.S.

*Secretary-Treasurer:* H. A. Orvis, M.D.

Council members holding over until December 1942:

Alice Miller, C.P.H.

J. H. Beard, M.D.

E. A. Piszczek, M.D.

Council member elected for one year:

Melvin H. Dobbs, B.S.

Council members elected for two years:

Mabel McClanahan, R.N.

E. K. Musson, M.D.

H. J. Shaughnessey, Ph.D.

W. W. Talbert, M.D.

## TEXAS PUBLIC HEALTH ASSOCIATION

AT its 19th Annual Meeting held in Corpus Christi in November the Texas Public Health Association elected the following officers to serve for the ensuing year:

*President:* Burke C. Brewster, M.D., Fort Worth

*President-elect:* Horace E. Duncan, M.D., Dallas

*First Vice-President:* Harold A. Wood, M.D., Austin

*Second Vice-President:* Katherine King Baker, R.N., San Antonio

*Executive Secretary:* Alan C. Love, Austin

The 1942 Annual Meeting of this Society will be held in Austin in the fall.

## THE AMERICAN SOCIETY OF TROPICAL MEDICINE

THE American Society of Tropical Medicine held its 37th Annual Meeting in St. Louis, November 10 to 13. The officers elected were as follows:

*President:* Dr. Ernest Carroll Faust, New Orleans, La.

*President-elect:* Dr. N. Paul Hudson, Columbus, Ohio

*Vice-President:* Dr. Joseph S. D'Antoni, New Orleans, La.

*Editor:* Col. Charles F. Craig, San Antonio, Tex.

*Secretary-Treasurer:* Dr. E. Harold Hinman, Wilson Dam, Ala.

*Councilors:* Dr. Andrew J. Warren, New York, N. Y., Col. James S. Simmons, Washington, D. C.

*Member of Editorial Board:* Dr. Justin Andrews, Atlanta, Ga.

During the meetings the Bailey K. Ashford Award in Tropical Medicine was presented to Dr. Lloyd E. Rozeboom of the Johns Hopkins School of Hygiene and Public Health, Baltimore.

#### HARBEN LECTURES

THE Harben Lectures of the Royal Institute of Public Health and Hygiene were given this year at the University of Toronto, December 1, 2, and 3, by Elmer V. McCollum, Ph.D., Professor of Biochemistry at the School of Hygiene and Public Health, Johns Hopkins University, Baltimore. The subject was "Nutritional Science and Public Health."

#### DELAWARE PUBLIC HEALTH ASSOCIATION ORGANIZED

AT a meeting in Wilmington, Del., on November 28, the Delaware Public Health Association was organized and the following officers elected:

*President*—Edwin Cameron, M.D., M.P.H.  
*First Vice-President*—G. H. Gehrman, M.D.  
*Second Vice-President*—Mrs. Anna Van W. Castle, R.N.  
*Secretary*—G. Taggart Evans  
*Treasurer*—Roger Murray, M.D.

Steps are being taken to apply for affiliation of the Delaware Public Health Association with the American Public Health Association.

#### AMERICAN ACADEMY OF TROPICAL MEDICINE

AT its meeting on November 12 in St. Louis, the Theobald Smith Gold Medal of George Washington University was awarded to Admiral E. R. Stitt, M.C., U.S.N., retired. The following officers were elected for the year 1942:

*President*—Dr. H. C. Clark  
*Vice-President*—Dr. L. W. Hackett  
*Treasurer*—Dr. T. T. Mackie  
*Secretary*—Dr. E. C. Faust  
*Councilor*—Dr. A. C. Chandler

AMERICA'S TOWN MEETING OF THE AIR announces a \$1,000 prize essay contest on the subject "What Must We Do to Improve the Health and Well-being of the American People?" Two sets of identical prizes are offered for adults and youths. Persons 21 years of age and over are privileged to compete in the Adult Division, and persons under 21 years of age in the Youth Division. The first prize in each division is \$250 in cash plus a free trip to New York to appear on "America's Town Meeting of the Air"; the second prize \$100 in cash; the third prize \$50; and there are 10 prizes of \$10 each for honorable mention.

Essays are not to exceed 1,000 words in length. Envelopes containing essays must be postmarked not later than February 1, 1942. Contestants are requested to indicate on their essays whether they are entered in the Adult or Youth Divisions.

Essays should be addressed to:

Essay Contest Editor  
 Town Hall  
 123 West 43rd Street  
 New York, N. Y.

#### MC GILL OFFERS DIPLOMA IN VETERINARY PUBLIC HEALTH

DR. GRANT FLEMING, Chairman of the Department of Public Health and Preventive Medicine at McGill University, Montreal, has announced the organization of a post-graduate course for veterinarians at McGill University in the Department of Public Health and Preventive Medicine of the Faculty of Medicine, leading to a Diploma in Veterinary Public Health (D.V.P.H.) to prepare veterinarians for the public health services and for employment with commercial firms engaged in animal industry. The first class enrolled for the session 1940-1941.

As in the case of all undergraduate students in the professions, the undergraduate training for the veterinarian



aims to prepare him for general practice. Through this graduate course he is prepared to undertake public health work in accordance with the present demands of the public health program where the veterinarian has been brought into the organization to assume responsibilities in connection with food inspection, particularly with the control of milk supplies.

#### AMERICAN STANDARDS ASSOCIATION

THE American Standards Association has announced the completion and approval of the American Defense Emergency Standard Allowable Concentration of Cadmium-Z37.5-1941. The standard as at present formulated will be in effect only during the period of the emergency, after which it will be reviewed by the Sectional Committee.

#### SOCIAL SERVICE AND DEFENSE

"MOST welfare officials will feel a strong and almost overwhelming desire to be a part of a bombing crew headed for Japan. We would want to do it even if we knew it was to be a one way flight. But let's be sensible. We know that most of us wouldn't make third rate mechanics. There is a job that we do know. It's a job which is vital to defense. It's a job essential to the maintenance of morale."

"Eric Biddle speaking before the Senate Finance Committee quoted a high British official as saying that *the greatly expanded social services in England did as much to win the Battle of Britain as the RAF*. If this is true, our job is one of major importance. Most people fear loss of security even more than they fear death by bombing. They are very sensible to feel this way because British experience indicates that modern war threatens their homes more than it does their lives. The English people know that no matter what happens to their homes as a result of air raids they don't have to worry about

their economic security. Their universal insurance will pay for and enable them to rebuild—some day. Through the social services their families will be fed, clothed, given shelter and medical care. What is lost is lost by all. What is saved is for the use of all. On such a foundation morale is built."—*Washington News Letter on Social Legislation*.

#### MARYLAND ADOPTS REGULATIONS FOR CONTROL OF COMMUNICABLE DISEASES

DR. RILEY recommended that regulations for the control of communicable diseases, as prepared by the American Public Health Association, be used and adopted by the State Board of Health. After discussion, on motion of Dr. Williams duly seconded and carried, it was ordered that the Report of the Subcommittee on Communicable Disease Control of the Committee on Research and Standards of the American Public Health Association, 1940 revision, as adopted by the United States Public Health Service (in their *Reprint 1697*), entitled *The Control of Communicable Diseases*, be adopted by the State Board of Health as a guide for policy determination in the matter of controlling communicable diseases in the State of Maryland.—*Excerpt from Minutes of Meeting of State Board of Health held on November 27, 1941*.

#### PERSONALS

##### Central States

W. W. BAUER, M.D.,\* was designated to represent the American Medical Association on the Committee for the Study of Voluntary Health Agencies, which is being established by the National Health Council, New York, N. Y.

RICHARD F. BOYD, M.D.,† of Topeka, Kan., has been appointed Director of the Midland County Health De-

\* Fellow A.P.H.A.

† Member A.P.H.A.

partment, succeeding DR. KALMAN S. VON HAITINGER, who resigned to engage in private practice in Midland. Dr. Boyd has been Director of Local Health Services for the Kansas State Board of Health.

JOHN A. CARTER, M.D.,† of Batavia, Ohio, who has been Health Officer of Clermont County since 1936, has been named Health Officer in Middletown County.

PAUL R. ENSIGN, M.D.,† of Topeka, Kan., has been named Director of the Boise-Ada County Health Unit, Ida., effective June. Until that time DR. GUSTAVUS DENTON BOCK, Boise, will be Acting Director.

BENJAMIN C. HOUGHTON, M.D., of Columbus, Ohio, has been appointed Local Health Commissioner of Upper Arlington.

OLIVIA T. PETERSON, R.N.,† Superintendent of Public Health Nursing, State Department of Health, Minneapolis, Minn., has been given leave to become Assistant Director of the American Red Cross Section on Home Nursing. Her offices are at National Headquarters, Washington, D. C.

#### Eastern States

MARIE E. DOHM, who since 1931 has been a member of the staff of the State Committee on Tuberculosis and Public Health of the New York State Charities Aid Association, has resigned to join the staff of the Illinois State Department of Health as a nutritionist in the Division of Child Hygiene.

JOHN E. GORDON, M.D.,\* Professor of Preventive Medicine and Epidemiology in the Harvard Medical School, Boston, and now Director of the American Red Cross Harvard Hospital Unit in England, arrived in New York on November 10 for a furlough,

expecting to return to England in about one month.

GILBERT E. MOORE, M.D., is the Acting Health Officer of Darien, Conn., to fill the vacancy caused by the death of DR. WILLIAM H. SLAUGHTER.

ROY V. SANDERSON, M.D., has been appointed Health Officer of Winsted, Conn., to succeed DR. FRANCIS GALLO.

ALFRED SCHIAVETTI, M.D., Stafford Springs, Conn., has been named acting Health Officer of West Willington, during the absence of DR. FRANK B. CONVERSE.

#### Southern States

LEONARD C. BATE, M.D., Health Officer of Greenup County, Ky., has been appointed to a similar position in Iron County, succeeding Dr. LORIN E. KERR, JR., of Stambaugh, who resigned to go to Ohio.

JOHN M. BEARDEN, M.D., has been appointed Health Officer of Laurens, S. C., succeeding Dr. L. M. PRICE, effective August 15.

MARY G. DEVINE, Acting Consultant Nurse, Division of Industrial Hygiene, National Institute of Health, Bethesda, Md., has been loaned to the Industrial Hygiene Service of the Georgia State Department of Public Health, Atlanta.

ROBERT D. HICKS, M.D., of Chester, S. C., has been named Director of the Chester County Health Department, succeeding Dr. WALTER G. CRAWLEY, JR., of Lancaster, who has been dividing his time recently between Chester and Lancaster Counties.

FRANCIS C. LAWLER, Sc.D.,† formerly Assistant Professor of Bacteriology and Public Health at the University of Oklahoma, School of Medicine, has accepted the Associate Professorship of Bacteriology in the School of Medicine at the University of North Dakota.

\* Fellow A.P.H.A.

† Member A.P.H.A.

JOHN I. MITCHELL, M.D., of Haleyville, Ala., has been appointed Health Officer of Winston Co., succeeding DR. WILLIAM A. DODSON, JR., of Double Springs, who resigned to accept a position with the U. S. Public Health Service.

WARREN H. REINHART, Associate Chemist of the Division of Industrial Hygiene, National Institute of Health, has been loaned to the Tennessee Valley Authority for an indefinite period to assist with the engineering control of health hazards associated with the construction of a hydro-electric project.

HENRY G. STEINMETZ, M.D., Arlington, Va., has been placed in charge of the health district incorporating Page, Warren, and Shenandoah Counties, succeeding DR. JOHN B. H. BONNER, of Luray, who resigned to enter private practice in Elizabeth City, N. C.

SAMUEL D. STURKIE, M.D., formerly of Charlottesville, Va., Venereal Disease Control Officer of Alexandria and Fairfax County, has been appointed Health Officer of Smyth County, succeeding DR. WILLARD W. GRIGGS, of Marion, who resigned to take charge of the Health Department in Newport News.

T. L. WADDLE, M.D.,† formerly District Health Officer of District No. 2, Dexter, Mo., has been transferred to District No. 4, Fredericktown.

THE HONORABLE HENRY A. WALLACE, Vice-President of the United States, was decorated on December 3 by the President of Cuba with the Order of Carlos Finlay during his visit in Cuba.

JAMES H. WELLS, M.D., Health Officer of Fulton and Hickman Counties, Ky., has been appointed Health Officer of Bell County to succeed DR. ADAM STACY, JR., of Pineville, who resigned to enter private practice.

### Western States

STUART W. ADLER, M.D.,† has been appointed Director of the Division of Maternal & Child Health of the New Mexico State Department of Public Health, Santa Fe, succeeding DR. HESTER B. CURTIS, resigned. DR. ADLER is a graduate of the Harvard Medical School and recently has been in practice in Albuquerque.

CHARLES H. BARR, M.D., of Portland, Ore., has been named Health Officer of Canby.

WALLACE D. HUNT, M.D.,† of Seattle, Wash., for 6 years Health Officer of King County, has been appointed Senior Surgeon in the U. S. Public Health Service, and assigned to duty as Regional Medical Officer of the Ninth Civilian Defense Area with headquarters in San Francisco, Calif.

LOUIS J. WOLF, M.D., of Portland, Ore., has been named Acting City Health Officer of that city. He succeeds DR. ADOLPH WEINZIRL, who is now on the staff of the University of Oregon Medical School.

### DEATHS

JACOBO FAJARDO Y PUNO, M.D.,† of Manila, P. I., died July 23. He was Past President of the Philippine Public Health Association, and formerly Executive Health Officer of the Philippine Islands, as well as Director of Health, Philippine Health Service.

ELLEN S. STADTMULLER, M.D.,† Chief of the Bureau of Child Hygiene, State Department of Public Health, San Francisco, Calif., died on November 26. DR. STADTMULLER was a member of the American Public Health Association from 1929.

### CONFERENCES AND DATES

American Association for Social Security. New York, N. Y. Probably April.

American Association of School Administrators. San Francisco, Cal. February 21-26.

\* Fellow A.P.H.A.  
† Member A.P.H.A.

# American Journal of Public Health *and* THE NATION'S HEALTH

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## Health Department Service in War Emergency\*

M. F. HARALSON, M.D.

*Territorial Commissioner of Public Health, Honolulu, T. H.*

FOR the past year there has been a gradual and continued increase in the duties and responsibilities of the Territorial Health Department, particularly on the island of Oahu. During this period, primarily as the result of the national defense program, there was a rapid increase in the population on the island, requiring additional public health services, especially in environmental sanitation, communicable disease control, food inspection, restaurant sanitation, public health nursing, supervision of water supplies, and problems relating to housing. A situation taxing the department beyond the point of efficiency existed and had been a cause for concern, even before the President, on May 27, declared a state of national emergency.

The Territorial legislature meeting in special session in October, 1941, recognized the acute needs of the health department and provided five additional sanitary inspectors as well as additional funds for the Tuberculosis Bureau of the health department.

Immediately following the President's declaration, the various departments of the federal government, already interested in military and civilian health and becoming more concerned for increased protection and conservation of the national health resources, urged expansion of public health services upon state and territorial health departments.

Because of Hawaii's distance from the mainland and the possible disruption of shipping, its military and naval importance and its strategic location, the health department recognized not only the need for expanding its regular functions but also the necessity for preparing for any type of emergency. Plans for improving the organization were formulated. Bureau chiefs were instructed to order and keep on hand sufficient supplies for the effective operation of their respective divisions for a period of at least 6 months. Biologic supplies, certain drugs necessary for emergency use, and laboratory supplies and equipment were recognized as especially important items. Measures for the protection of water supplies and sewage disposal systems in the event of damage, espe-

\* Reprinted by permission from *The Hawaii Health Messenger*, Honolulu, T. H., 1, 6 (Dec.), 1941.

cially on Oahu, were carefully considered. Plans were evolved to provide a satisfactory sanitary inspection service under emergency situations. A course in first aid instruction was organized for the public health nursing force. It was anticipated that the nurses would be called upon for additional services during an emergency, including first aid work, bedside nursing care, and obstetrical and delivery service. Plans were made for gearing up all public health services to meet the impending war emergency.

When the Honolulu Disaster Council was organized, the Territorial Commissioner of Public Health was named chairman of a health and sanitation committee, composed of representatives of various related health, medical and welfare agencies. It was pointed out in the preliminary report by the committee that its functions would be practically identical with those normally carried on by the Board of Health, except for necessary expansion in specific activities to meet emergencies as they developed. It was recognized, in the event of war, that the problem would not be so much revising the type of service offered by the health department but extending its normal program and correlated services with those of the civil and military authorities and other agencies concerned with the promotion and conservation of health.

Seven months after President Roosevelt's declaration, Pearl Harbor was attacked by an enemy force. The first bombs were dropped on the island of Oahu just before eight o'clock, Sunday morning, December 7, and later that day martial law was established. The military governor asked that all departments of the Territorial Government continue their special functions.

Within an hour after the first bombs fell, the executive heads of the health department were in conference and plans and arrangements were made for

carrying out the various services which seemed to be required at the moment. An inventory was taken of the biologic supplies on hand at the health department and the various pharmaceutical supply houses in the city. All members of the health department on Oahu were placed immediately on 24 hour call. Day and night service was established at the office of the Board of Health and was maintained for a period of two weeks following the initial attack.

A close liaison was established with the medical departments of the Army and Navy, the medical director of the first aid stations, the medical officer in charge of the Emergency Hospital, and municipal authorities, particularly those in charge of the water supplies, the sewerage system and garbage collection. All were urged to utilize the facilities of the health department to the greatest possible extent.

In order that appropriate measures for the prevention and control of communicable diseases might be instituted at the earliest possible moment, instructions were sent immediately to all physicians requesting the reporting of communicable diseases by telephone. Physicians were also requested to report all cases of illness suspected of being caused by contaminated food, milk, or water. This communication was followed by an order from the office of the military governor, directing physicians to comply with the request. A number of cases of acute gastroenteritis were reported. Epidemiological investigations and laboratory analyses were made. Most of the cases were traced to consumption of food which had been kept too long under improper refrigeration. No unusual prevalence of communicable diseases occurred.

After the attack, requests by hospitals and physicians in charge of first aid units were made for various essential biologic supplies. Prophylactic tetanus antitoxin was in particular demand. Re-

quests were excessive in some instances and physicians were advised to limit their requests to those immediately needed.

An immunization station for inoculation against typhoid fever and vaccination against smallpox was opened in the office of the Board of Health. Restaurant and general sanitary inspection services were intensified. Food supplies were carefully checked. Dairy inspection service was augmented and every assistance given to insure a continued supply of clean and wholesome milk and dairy products.

During the first few days rumors were current that the water supply had been contaminated or poisoned, none of which, upon investigation and examination, were found to be true. Water samples were immediately collected at various points throughout the city by Board of Health inspectors working in close coöperation with the Board of Water Supply. Bacteriological, chemical, and physical analyses were made. A portable chlorinator and a supply of chlorine gas purchased for emergency use were available, but thus far have not been required. Fortunately, no damage to water or sewerage systems in civilian districts was sustained during the first attack, which was limited for the most part to military objectives.

In view of the close proximity of residential districts to many military objectives, it became immediately necessary to evacuate a large number of civilians and military dependents to sections of the island removed from the points of attack. One of the important services rendered by the nursing department was the health supervision at evacuee centers where large numbers were being housed in schools, churches, and other community buildings. A number of nurses reported to first aid stations and hospitals for emergency nursing services. Other nurses, particularly in rural districts, supervised the setting up of first

aid stations and the obtaining of necessary supplies for their operation.

In order to make available additional beds in local hospitals for war casualties, it was necessary to evacuate certain patients for home care. Public health nurses were placed on call for bedside nursing care of these and other patients upon the request of a physician. Private physicians were notified that this service was available and were urged to utilize public health nurses when private nurses were not obtainable.

In anticipation of possible difficulties of transportation and the need of hospital space for other purposes, the Bureau of Maternal and Child Health developed a plan to assist in the delivery of prospective mothers in their homes. Delivery packs were prepared by the nursing division and made available for use. Obstetrical services were rendered by the public health nursing force in a small number of instances.

The general clinic program of the Bureau of Tuberculosis was somewhat curtailed. However, a number of sputum negative cases were discharged from the tuberculosis sanatorium on Oahu, and placed under the supervision of the outpatient clinics and public health nurses.

The Bureau of Mental Hygiene reported that a number of individual cases had come to their attention who had been on civilian defense duty too long without rest. These cases were given general treatment. Other mental patients who had become adjusted and discharged returned for treatment.

The Bureau of Pure Food and Drugs made chemical analyses on water and food when contamination or chemical poisoning was suspected.

Other administrative details requiring immediate attention were proper identification of all employees, including registration and finger printing, rationing gasoline for all cars used on official business, requisitioning gas masks, and

adjusting duties of personnel to care for vacancies caused by the induction of employees into the armed forces.

Although the first attacks were directed solely on the island of Oahu, it is needless to say that the suspense on the outside islands was as great if not greater than on the island of Oahu. With the radio and other methods of communication suspended shortly after the engagement began, followed only by occasional brief instructions to the public, the outlying islands were isolated. It was impossible for the health department to obtain any information or to issue instructions to the outlying districts. It is noteworthy, however, that the health department's representatives on each of the outer islands, coöperating with the Army and other officials, immediately took steps to protect the water and food supplies, strengthen the control of certain communicable diseases, and to utilize other public health services to the best advantage to meet local conditions. Extra biologic supplies and drugs were distributed to the several islands as soon as transportation became available.

The Territory of Hawaii will continue to play an extremely important part in the prosecution of the present war. What new health hazards may arise cannot at present be foreseen. Although many health problems will be aggravated because of the war, others may become less acute. Certain general principles of public health and valuable experience already gained will guide health officials in this emergency.

The Board of Health will continue to coöperate closely with the military authorities and other governmental and private agencies in the protection of the public health. Every effort will be made to maintain and safeguard water supplies, milk, and other vital foods. Regulations for the control of communicable diseases will be strictly enforced, lest abnormal conditions lead to the outbreak of an epidemic. Because of the important bearing of community health on morale, the health department through its various services will attempt to teach the public to make an intelligent adjustment to the current war emergency.

# Stamp Out Gonorrhea Now!

JOHN L. RICE, M.D., F.A.P.H.A.

*Commissioner of Health, City of New York, President, American Public Health Association*

GONORRHEA, next to the common cold, is estimated to be the most prevalent communicable disease. It is the cause of great disability among the armed forces as well as among industrial workers. If health departments and other public health agencies support a well conceived and expertly conducted anti-gonorrhea campaign with the enthusiasm and determination that they brought to typhoid fever prevention, they can and should get comparable returns in the decrease of illness, increase in the number of man-hours available for production, and lives saved.

Never until now has the public health officer been equipped to deal effectively with gonorrhea. Until the chemotherapeutic attack by the sulfonamides, he had no specific therapy for this disease. Gonorrhea, dependent for its cure on the dexterity of the physician, has indeed been the "stepchild" of medicine. Past campaigns against the venereal diseases have of necessity been aimed almost exclusively at syphilis.<sup>1</sup> Against gonorrhea the health officer was armed with little more than a pious wish. Manual attack upon a virulent gonococcus in the urethra or in the cervix was often meddlesome therapy and oral therapy was much the same as that at the beginning of the 19th century.

Until recently the organization of a gonorrhea clinic necessitated expensive equipment, costly instruments, and a highly trained staff to carry out the delicate procedures deemed necessary. Specific chemotherapy has, in the great majority of cases, rendered obsolete all

previous types of therapy. Sulfathiazole makes it possible for any practitioner or health officer, however remote from the laboratory, to control gonorrheal infections. It is possible that other more efficient sulfonamide drugs may be developed in the near future. One of these, sulfadiazine, is already in use, but has not been so thoroughly studied, nor is it so generally available, as sulfathiazole.

Dr. Edward L. Keyes, writing from the viewpoint of the urologist, has said: "The prime essential in the successful treatment of gonorrhea is to get the physician out of the urethra. If chemotherapy has done no more than this, our patients would have much to be thankful for."<sup>2</sup>

But it has done far more than this. In sulfathiazole the physician and health officer have an almost ideal remedy wherewith to attack gonorrhea. Its forebear, sulfanilamide, when used for treating gonorrhea, produces in some instances toxic disturbances. Yet Dr. R. A. Vonderlehr, Assistant Surgeon General of the U. S. Public Health Service, tells us that "only 200,000 tablets of this compound [sulfathiazole] were reported purchased and distributed by state health departments during the first half of the present [1941] fiscal year, as compared with three and one-quarter million sulfanilamide tablets."<sup>3</sup>

Health departments and public health workers must make use of the most efficient compound now available if they wish to stamp out gonorrhea. State, county, and city health departments will recognize that here is an oppor-



tunity they must press to the utmost. The war emergency presents an additional reason.

Sulfathiazole in appropriate dosage, 0.5 gm., four times daily (serious injury may result if given in larger dosage) usually excites no toxic reaction and almost never causes the grave reactions with which sulfanilamide has made us familiar. Sulfathiazole after about ten days of treatment cures 85 to 90 per cent of gonorrhea cases, acute or chronic, regardless of age, sex, or race. The remainder of the uncured patients usually respond favorably to further treatment with the same medication.<sup>4</sup>

An effective public health policy for the attack on gonorrhea is now for the first time practicable. We now have the power to stamp out gonorrhea. Enteric fever has been conquered with less.

The "Stamp Out Gonorrhea Now" campaign should emphasize, first, that the disease can be cured simply, effectively, and in a short time, and, secondly (and of no less importance), that sources of infection and contacts can and must be followed up. Events of the past decade have developed in our people a new social conscience.

Proper, adequate, well publicized facilities should be provided in every community for the diagnosis and treatment of gonococcal infections for those unable to pay a private doctor. Those who can afford to pay should be urged

to seek the service of a private physician. Health departments should assume leadership in providing the physicians of each community with up-to-date information on the modern diagnosis and treatment of gonorrheal infections.

Public health agencies should not only recognize their new responsibilities in this field but should take immediate action to carry out their obligations. A well planned anti-gonorrhea campaign, similar to that against syphilis, is applicable today and with prospects of even more immediate and impressive results.

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# Uniformity in Control of Communicable Diseases\*

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AT the forty-third annual meeting of the American Public Health Association and the fifteenth annual conference of sanitary officers of the State of New York at Rochester, N. Y., a symposium on the administrative control of infectious diseases was held on September 10, 1915, under the joint auspices of the Section of Public Health Officials and the Department of Health of New York City.

The impetus for such a conference on the oldest, best developed, most widely recognized and generally effective of the functions of civil health authority was an inquiry in person and by mail correspondence between the director of the Bureau of Preventable Diseases of the Department of Health of New York City and the late Dr. John S. Billings and officers of health of a considerable number if not all of the cities of 100,000 population and over in the United States.

This exchange of information as to the prevailing administrative policies and regulations intended for the control of the common acute communicable diseases revealed striking and inconsistent variations in such matters as notification, verification of diagnosis, placarding of premises, isolation and quarantine periods, terminal fumigation, disposal of

the dead, and supervision of carriers. An effort seemed to be called for to determine an optimum or adequate procedure which would at the same time be consistent with the facts established by the medical sciences, be acceptable to prevailing medical opinion, and be practicable of enforcement by educational persuasion or the authority of sanitary codes.

Ten papers were presented, six by officers of the Department of Health of New York City: Drs. John S. Billings, William H. Park (two), S. Josephine Baker, Robert J. Wilson and B. F. Knause, the other four by Drs. F. G. Curtis, Health Officer of West Newton, Mass.; A. J. Chesley of Minnesota State Department of Health then as now; C. S. Caverly, the State Health Officer of Vermont; and C. J. Hastings, the Health Officer of Toronto, Canada.

As a result of the evidence and opinions expressed in the papers and discussion that followed a committee of the Section on Public Health Administration was appointed in October, 1916, to formulate Minimum Requirements for the Control of the Common Communicable Diseases. The first report of this committee was published in *Public Health Reports*, October 12, 1917, Vol. 32, No. 41. The report as published was presented to the Section on Public Health Administration on October 19, 1917, at the forty-fifth annual meeting of the Association in Washington. A

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\* Read before the Health Officers Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 16, 1941.

note in the program announced that "at least one hour will be given to discussion of the report."

At that time the nations within the scope of the A.P.H.A. were pressing every resource of materials and intelligence into the service of their armed forces. Nothing but the most effective and wise measures for health protection of the civilian population as for the Army and Navy was to be thought of. The discussion was active and vigorous, not to say violent, as one after another of the traditional but unsupported common procedures was attacked and discarded by the committee. No essential changes were made in the report, which was approved by the Section and endorsed by the A.P.H.A. and the U. S. Public Health Service, and was made official for use by the Army Medical Corps in this country and in the A.E.F.

The report did not do precisely what the committee was asked for. Instead of formulating minimum requirements for the control of the common communicable diseases, the committee presented a brief synopsis of the established facts concerning each notifiable communicable disease, acceptance of which would determine the procedures, rules, and regulations likely to prove useful in prevention or control of the respective diseases. The report put into the hands of the health board, council, or officer the facts upon which sanitary ordinances dealing with control of communicable diseases could be based, leaving it to local or state jurisdictions to phrase their regulations in ways consistent with the statutes or charter provisions of the various states and cities.

On October 11, 1926, at a joint session of the Section on Public Health Administration and the Committee on Administrative Practice at the fifty-fifth annual meeting of the A.P.H.A. and the twenty-fifth annual conference of New York State Health Officers at Buffalo, N. Y., the second report of the Com-

mittee on Communicable Disease Control was presented and discussed at length. Such changes as were warranted by additions to our knowledge of the natural history of the notifiable communicable diseases during the intervening ten years were incorporated in this report, which was again approved by the Section, by the Association and by the U. S. Public Health Service. This report was published in *Public Health Reports*, December 17, 1926, Vol. 41, No. 51.

The third report of the committee, now under the auspices of the Association Committee on Research and Standards, with still further changes to bring it up to date with the growing accuracy and completeness of medical and epidemiological information, was published in *Public Health Reports*, August 9, 1935, Vol. 50, No. 32, as approved by the A.P.H.A. and the U. S. Public Health Service.

At the time of the 1940 meeting of the Association in Detroit, October, 1940, a request was made by the Surgeons General of the Army, Navy, and Public Health Service, and by the American Medical Association for an immediate revision of the report to meet the medical needs of the defense effort of the nation. The committee's fourth report prepared in October, 1940, was published as *Reprint No. 1697* from the *Public Health Reports* in January, 1941, is now the official text of the A.P.H.A., and is in use by our armed forces and by the U. S. Public Health Service.

You will I trust pardon the detail with which I have related the history of this effort on the part of our Association to make convenient and widely available the basic facts which must in any event determine the formal official administrative control of the notifiable communicable diseases, in view of the further information I now present.

In 1939 on behalf of the Committee on Administrative Practice I studied the

procedures for communicable disease control in effect in 56 political units of the United States by correspondence with officers of state, insular, and territorial health jurisdictions, to learn the extent of their variance from or agreement with those approved by the Association and the U. S. Public Health Service. Shortly thereafter I made a similar study of the procedures in effect in the 9 provincial health jurisdictions of the Dominion of Canada. The results of these two studies were presented before the Conference of State and Provincial Health Authorities of North America on April 22, 1939, and the joint session of the Canadian Public Health Association and the Ontario Health Officers Association on June 12, 1939, respectively, and these were published in the July, 1939, issues of the *American Journal of Public Health* and *Canadian Public Health Journal* respectively. Let me quote two short paragraphs from these communications.

The inconsistencies between reasonably exact experience or observation of incubation and communicable periods of these notifiable diseases and much of the regulation of isolation and quarantine as implied or specified in the publications of state health authorities, and in the main obligatory upon the respective subordinate health jurisdictions of the states, appear to me to be so considerable in number and degree as to justify your attention.

. . . . .

You will find more numerous, and often quite inexplicable inconsistencies between fact and application in the requirements of the states of the United States, than among the provinces of Canada, but it would appear that even in the latter there are expressions of legal authority too varied to carry conviction of their reasonableness or necessity in all instances.

In recent months I have again made inquiries as to the extent to which regulations are consistent with established fact to meet the request of your Section Secretary that I present this subject for your consideration. It would appear

that there remain, or have been incorporated in the sanitary regulations and public health laws of a considerable number of our states, requirements that contribute little if at all to the control of the communicable diseases in question, because they are based upon misinformation as to the natural history of the disease in question. Furthermore there are frequent instances of differences of health procedures within states, in cities, and other local jurisdictions which reveal a confusion in the minds of the respective health officers which can hardly have a favorable effect upon physicians and patients in these communities.

About 15 of the states and several of the insular and territorial health jurisdictions operate under health laws and ordinances which include effective rules and regulations for communicable disease control which are practically identical or consistent with the procedures described in the current report of the committee. In most if not all of the other state, insular, and territorial health jurisdictions there are departures more or less marked from those which present-day knowledge of the communicable diseases would suggest as reasonable and sufficient.

Without attempting the tedious and perhaps invidious process of criticism of particular states, it can be said now as at any time over the past twenty-five years that one or more of the following types of unsuitability characterize the control measures required for one or more of the communicable diseases in about two-thirds of the states: lack of notification of some disease for which modern standards of health service appear to demand notification; placarding premises where cases of various communicable diseases are reported, under circumstances that make observance of isolation or quarantine neither likely nor helpful in preventing secondary or subsequent related cases in the home of

the index case or elsewhere; failure to verify the diagnosis of certain important diseases by an expert clinician, by laboratory test or by both; requiring isolation periods for infected persons and quarantine periods for exposed susceptibles which are significantly inconsistent with the known periods of communicability and incubation of the particular disease; failing to provide for a consecutive sanitary supervision of carriers from the time of the clinical course of the disease, or the first discovery of a carrier state, until it can be shown that these persons are no longer spreaders of infection; use of fumigants for terminal disinfection of some of the bacterial and virus diseases.

It would seem in the interest of respect for medical science and the authority of the health officer that there should be a general and nation-wide uniformity, first of information concerning the natural history of diseases subject to sanitary control, and second, of procedures which involve questions of personal liberty and supervision of the home by the police power of the state.

When one seeks to learn the reasons why in a given local community or state the regulations in effect for control of communicable diseases in some respects are at variance with those accepted by the A.P.H.A., and the three Surgeons General of the federal government, the usual answer is that local regulations are necessarily those issued by the department of health of the state or are actually included in statute law enacted by the state legislature. The local health officer or his board of health only in exceptional conditions, such as those of cities operating under a charter from the state, can make their own regulations independent of those prevailing in the state as a whole. It rests primarily with the state health officer and his board or council to enact such sections of a sanitary code, or persuade the legislature to enact equivalent public health

laws which will be consistent with widely accepted professional opinion. If the state health officer does not accomplish periodic revision of sanitary regulation of communicable diseases to keep practice abreast of the best recent knowledge of the medical sciences, two sources of political pressure can and should be brought to bear upon him or his board or council or the state legislature, namely, that of the organized medical profession of the state and county societies.

It is expected that to keep pace with the advances of medical science, a revision of the report *Control of Communicable Diseases* will have to be made at five year intervals, the next one in 1945. It should be a primary concern of each state health officer and of all independent health jurisdictions with responsibility for enacting sanitary ordinances, rules, and regulations, to review their procedures for control of communicable diseases now to make sure that these are consistent with the information and advice of the latest report of the committee of the A.P.H.A. and to repeat this review and revision periodically following the issue of new editions.

Let me give you illustrations of the extent to which various state regulations conform to the recommended practice:

New York and Connecticut are said to have the best state sanitary codes.

#### OTHER STATES

##### *State A (Middle Atlantic) (July, 1941)*

Common variations from the best practice are an unnecessarily long period of isolation for scarlet fever (30 days or more instead of 21 days) and a period of 10 days for quarantine of susceptibles exposed to a case of scarlet fever instead of 7 days or less. Another error is releasing typhoid fever patients without control tests of feces and urine for the typhoid bacillus. Termination of isolation in typhoid fever, by recovery, death, or removal of patient is not safe and permits easy failure to detect convalescent and chronic carrier states. There is widespread confusion in the use of the terms isolation and quarantine,

which, by the way, are not synonymous. Terminating isolation of a case of chicken pox on the basis of disappearance of all crusts has no scientific or practical basis in fact. The period of communicability is probably not more than 6 days after appearance of the first crop of vesicles, and certainly not more than 10 days, regardless of the date of disappearance of the scabs of skin lesions.

In the state law quarantine of premises is confused with isolation of patients.

#### *State B (Mountain)*

Chicken pox isolated for 12 days after eruption and until primary crusts have fallen off. Concurrent disinfection includes boiling dishes and linen. Rigid enforcement of regulations is called for in cases and contacts of chicken pox. It is said that cases may spread the disease as long as crusts are present.

Toys of chicken pox patients may be washed in lysol, dried in the sun, and kept out of circulation for 2 weeks, surely unnecessarily exacting.

Measles is isolated 8 days after the appearance of the rash, although 5 days is known to be the period of communicability after the appearance of the rash.

Non-immune children are isolated and kept under observation for 3 weeks, a practice which is too severe and probably unjustified and unproductive of protection.

Whooping cough is isolated for 6 weeks from development of paroxysmal cough. The Report says 3 weeks is enough.

Placarding of premises is called for where diarrhea of children occurs, and for chicken pox.

Gaseous fumigation of room occupied by a patient with a contagious disease is required where the case terminated in death or the patient was removed before recovery. If case recovers, clothing and upholstered furniture must be fumigated or sunned and aired for 2 days. In the Report fumigation is not advised except to destroy insect vectors.

#### *State C (West North Central)*

Chicken pox—Communicable 14 to 21 days until primary scabs have disappeared from skin and mucosae. Placarded. Quarantine until scars are completely healed, at least 12 days from eruption. Report recommends quite otherwise.

Mumps—Isolate until 1 week after disappearance of swelling. Report says mumps is communicable no longer than the swelling of gland.

Measles—Isolated for 7 days after appearance of rash.

Scarlet fever—It is declared to be commu-

nicable 5 weeks from onset, and isolation is at least 28 days.

Typhoid fever—Release on two negative stools. No mention of urine.

Whooping cough—Communicability probably lasts 2 weeks after the whoop. Isolation minimum of 42 days or 1 week after last paroxysmal cough or whoop. Strict isolation. Public funeral prohibited. Report says isolation of children over 2 years of age is impracticable and in even those under 2 should not be insisted upon at the expense of fresh air in the open if weather permits.

#### *State D (West South Central)*

Quarantines scarlet fever, diphtheria, small-pox, epidemic cerebrospinal meningitis, anterior poliomyelitis, whooping cough, measles, epidemic influenza, mumps and chicken pox.

Placards typhoid, leprosy, acute pulmonary tuberculosis, venereal diseases (if treatment is refused by known prostitutes). Placarding not regarded as quarantine but merely as notice to the public.

Scarlet fever—Quarantine of exposed susceptibles for 10 days.

Poliomyelitis—Isolation 3 weeks. Report says 2 weeks. Quarantine of exposed susceptibles 3 weeks. Report says 2 weeks. Patient excluded from school and public gatherings 3 weeks after closing isolation. Report does not advise this.

Whooping cough—Isolation until 1 week after cessation of whoop. (About 6 weeks.)

No mention of notification of pneumonia, or rabies, or trachoma.

#### *State E (West South Central)*

Includes pellagra and cancer among reportable communicable diseases. Requires insurance company agents (not specifying life insurance) to report communicable diseases.

Meningococcus meningitis isolation required until 1 week after fever subsides. Report recommends 14 days after onset.

#### *State F (South Atlantic)*

Publishes as its *Official Bulletin on Control of Communicable Diseases* in 1938 the report of the A.P.H.A. committee for 1936 verbatim. *Reprint 1697*. Good practice and likely to be copied by some other states.

It is suggested that in the interest of approximate uniformity of official procedures for control of communicable diseases this Section, by appropriate resolution, recommend to state and local health officers the practical application

of the facts of medical knowledge upon the natural history of the usual notifiable communicable diseases as these are expressed in the current report of the Committee on Control of Communicable Diseases, and that as this report is from time to time revised to include new facts applicable through administrative procedures and is thereafter approved by the A.P.H.A. and endorsed and published by the U. S. Public Health Service, all health officers modify their sanitary ordinances, rules, and regulations accordingly, or use their official influence to obtain necessary action to the same end by the appropriate legislative body.

Furthermore it is suggested that a continuing Section committee be appointed to report from time to time the extent to which administrative procedures have been made consistent with

the currently accepted and published facts as to the natural history of the notifiable communicable diseases.

Consistency, uniformity, standardization are all qualities of official performance which may either create a false sense of excellence, while in fact expressing no more than a dull and lifeless habit or routine repetition of traditional methods, or may express the coöperative competence of a body of officers of government all equally alert to the necessity of constant adjustment of the authority of the law and the force of public education to the development of new knowledge, and prepared by their professional organizations to use the democratic methods of open discussion and representative committee work to keep their public services abreast of the facts.

# Air Raid Medical Administration— Current British Practice\*

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IT was a rare opportunity to be designated by Mayor F. H. LaGuardia, U. S. Director of Civilian Defense, to serve as one of a group of consultants and to go on July 12 by clipper plane as a member of the American Civil Defense Mission to study current British practice in the matter of air raid medical administration.

To fly the Atlantic at 8,000 feet, to set one's watch from 9 p.m. to 2 a.m. in the flash of a second, to skim by at 150 miles an hour alongside of huge inverted pyramidal cloud formations in three dimensions, standing on their points 500 feet high, and with a Grand Canyon in a cloudbank on the opposite side dipping down 2,000 feet toward a dark morocco-leather blue ocean, with its white caps like snowflakes, was surely a fitting introduction to the well known communities of old England that were just catching their breath after the horrible and destructive blitzing of last winter and last spring.

There were six of us on the mission; two city engineers, two police chiefs, a housing and buildings commissioner, and a medical man; each assigned the task of studying the most recent developments in this new and unheard-of type of warfare that may come almost without warning to anyone's front doorstep or office building, including yours or mine. As Mr. LaGuardia has pointed out in quoting from an official bulletin

issued in England in 1938, just prior to the beginning of hostilities:

The need for . . . (these measures for safeguarding the civilian population) is not related to any belief that war is imminent. It arises from the fact that the risk of attack from the air, however remote it may be, is a risk that cannot be ignored, and because preparations to minimize the consequences of attack from the air cannot be improvised on the spur of the moment but must be made, if they are to be effective, in time of peace.

From Mayor LaGuardia to Ambassador Winant to Sir Herbert Morrison, Minister of Home Security at Whitehall, was a rapid and pleasant transition. Mr. Morrison, a man not unlike Mr. LaGuardia in temperament, presides over what would perhaps be our Department of Interior with certain added functions, particularly the national and local police and a large part of the air raid first aid medical services. Other related work, especially the emergency hospital program for the care and treatment of air raid casualties, belongs within the scope of the neighboring Ministry of Health, close by, indeed next door at Whitehall, under the shadow of the cenotaph that commemorates the dead of the last World War.

Mr. Morrison turned us over to Wing Commander John Hodsoll who, since long before Munich and Dunkirk, was assigned to captain what has developed into the most marvelous civilian army that defends the home front and cares for the wounded during and after the blitz. Hodsoll, the best type of British civil servant, conscientious, patient, and

\* Read before a General Session of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 17, 1941.



kindly, introduced us into the intricacies of the Air Raid Precautions Department (known in England as the A.R.P.) in the Ministry of Home Security. This corresponds to what is now being built up in this country under the term Civilian Defense. Hodson described carefully that a blitz was aimed to destroy the morale of the people and that the work in civilian defense is primarily to preserve and enhance the people's morale. All of the A.R.P. services are aimed at supplying, as promptly as possible, the human needs of the victims of the blitz. These needs, of course, include medical needs, such as first aid, ambulance and hospital services. They take their place side by side with the work of the air raid wardens, the police and fire and rescue and gas decontamination and billeting officials and trained workers, and in close collaboration with a multitude of allied A.R.P. personnel, some full-time, some part-time, some paid and some volunteer, who man the report centers and the control centers and the roof watching points and the community and industrial blackout services; all in the vast British A.R.P. army.

In carefully printed detail the U. S. Office of Civilian Defense in Washington had already secured the experience of the British officials and it was our duty to review this work on the spot and with an eye to most recent modifications and developments in selected special fields. There was practically no bombing in England during our month in that country; so what we saw was prior destruction and the tired army of civilian defenders getting their breath, keeping in practice, recruiting their strength, and preparing for future onslaught. We were all struck with the superb morale and ability "to take it" of the British people, with their oft-repeated expressions of gratitude for the essential assistance they were receiving from the United States, and their bull-

dogged insistence on the rightness of their cause and their certainty that together we would win.

While other members of the mission were busy in Scotland Yard or studying communal and individual shelters against the blitz, and the engineering problems of "protecting" basement quarters for sleeping and housing the A.R.P. army, and the reënforcing of basement hospital operating rooms and allied report and control telephone centers and lines of communications, as well as the questions of the water mains and sewer lines, gas and electric community and regional utility services, I slowly absorbed the differences between such items as a First Aid Party, a First Aid Post, a First Aid Depot, and a First Aid Point. Besides these, attention was given to the duties of the Stretcher Party, the Ambulance Party, the Rescue Party, and the work of the Incident Officer, the work of the Incident Doctor and the other medical units that fight in this backyard trench of a modern blitz war.\*

The very choice of the word "Incident," which is the official designation carefully selected when reference is made to the site of a "bombing" shows the pains with which the psychology of the problem of preserving civilian morale has been approached in England. The First Aid Party, of course, is a group of four trained workers under a trained leader, whose task it is to render first aid treatment either at the incident or at a First Aid Post, which is a carefully prepared and "protected" spot where the wounded may be taken by the Rescue Party or by a Stretcher Party. The First Aid Depot is where the First Aid Party sleeps and rests to recover from its fatigue; for we must not forget that London underwent at

\* For a good description of the blitz from the human side (the A.R.P. workers and the victims), see a recent volume entitled "Digging for Mrs. Miller" by John Strachey, a London air raid warden. Random House, publisher, New York, pp. 150, \$1.25.

least sixty continuous nights of bombing, and all the A.R.P. personnel must have places where they can recuperate and sleep. And then the First Aid Point was finally discovered and identified as a rural First Aid Post, at a cross-roads farm or store where one could find a trained worker with some bandages and a stretcher and a telephone in case of need, so that an ambulance might be called to take a casualty to the nearest hospital.

One of the more recent developments in the First Aid service is what is known as the "Incident Doctor," usually a man in private practice called by the air raid warden from a roster to circulate in his district from place to place where there may be wounded persons at an incident. He leaves a nurse or nurse's aide at different strategic points and makes his rounds, encouraging those who have not yet been taken in ambulances to rest centers or hospitals. We were told that such a medical man was invaluable in enhancing the morale of the wounded.

In the Ministry of Health, Professor Fraser, Chief of the entire emergency medical service, and Chief Medical Officer Sir Wilson Jameson, were extremely gracious in supplying the most recent printed and circular directions and instructions for the medical services associated with the blitz. These in large number have been brought to Dr. George Baehr, Chief Medical Officer of the U. S. Office of Civilian Defense, for his use in planning for similar services in this country.

Professor Fraser pointed out that the first essential in organizing emergency medical services for civilian defense was that these should be thoroughly elastic so as to be able to meet unexpected needs. He described the superb nationwide acceptance of the theory of mutual aid, where one community comes to the assistance of another when the latter has more of a blitz than it can handle,

or one portion of a community comes to the assistance of another portion, in prompt response to telephone requests. He described the difficulties of evacuating children from families in cities out into rural areas, and indicated that the last word had not been said on policies of this kind, most difficult indeed of determination. He made it possible for us to study the organization of the complicated ambulance service, including ambulance trains such as those capable of taking wounded armies from the coast after Dunkirk, and the ambulance busses like our Greyhound busses in large numbers, reconditioned for special inter-hospital stretcher service, and then the use of ordinary trucks or motors equipped for ambulance duty. Through his kindness it was possible to see the organization of one of the great hospital sectors which serves London. This included a detailed review of the problems of evacuating hospital beds from the center of a great metropolis outward into the rural country by stages over a distance up to fifty miles; with the transformation of peacetime hospital administration so that government and volunteer hospitals were unified under a single Sector Chief, operating by a telephone control service. Such sector arrangements weld together as many as thirty institutions to meet the needs of the blitz. A visit was paid to a large mental hospital that had been transformed into an even larger surgical casualty receiving hospital in a rural area, and to another large rural hospital that had been "upgraded" by the addition of about ten fairly large wooden bungalow shack wards that were necessary to meet the special needs of the blitz. And we learned of the great difficulty in securing needed staff and equipment for hospital and other related services.

It was possible for us to study these intricate problems of civil defense not only in the great metropolis of London,

but also in other smaller cities north and south and in rural areas where the blitz had left its mark of destruction and where we found the A.R.P. army training and practising for future encounters with the enemy. In some we saw large hospitals razed to the ground, and warehouses, business areas, and the homes of the working people all bearing mute testimony to this new and terrible method of attack.

The first aid and nursing and medical and ambulance personnel in the A.R.P. army were, to a large degree, on a part-time basis and on part-time pay. Some physicians received annual salaries and some were paid on a fee basis. There was a skeleton corps of full-time workers on full pay and a large number of non-paid volunteers. The costs, for the most part, were borne by the national government through grants in aid to the local authorities. The satisfactory relationships existing between the Home Office in Whitehall (through the regional directors) and the local authorities was most gratifying to observe. Then too, the use by the national government of the best brains for research study at a special laboratory near Oxford was indeed heartening and profitable. The determinations of medical significance affecting A.R.P. policies were being placed by this laboratory at the disposal of the Ministries in London, as well as being made available to the national medical research councils of the United States and Canada.

As a health officer it was a bit distressing to me to notice that this great task of administering the local emergency medical and hospital services for the current war was often assigned to the medical officer of health of the community. In England it appears to have been customary to overload local health departments with administrative cares and duties such as hospital administration and medical care and other such

work so that the essential preventive duties of a health department, for which it was originally created, are to some degree starved by lack of available time and attention and budgets. Here in the matter of medical and other A.R.P. services for civilian defense in a blitz war, this pattern has again been frequently followed with an unfortunate decrease of health officer attention to many primary duties and responsibilities. The result is, in part, large numbers of children and others unprotected against smallpox and diphtheria, large volumes of unpasteurized milk in urban communities, little or no industrial hygiene as health department work, and syphilis and tuberculosis far from where they could be so far as adequate community control is concerned. It would seem unfortunate if we did not learn, in this country, something of value from these lessons.

Dr. Jameson and Dr. Parran and Dr. Eliot have discussed the great problems of fatigue and nutrition and communicable disease control in the public health picture of Great Britain during this war, and have included the matter of government subsidies for milk and the national wheatmeal loaf of bread containing the entire vitamin B complex. Because such subjects have already been covered, these remarks must limit themselves to the matter of air raid medical administration.

No discussion of this type would be complete without some comment on superb service rendered by the women in England during the blitz war. In all capacities they serve side by side with the fighting forces and with the civilian defense army. In an address to a large gathering of the latter held in London last July, Sir Ernest Gowers, one of the metropolitan leaders in A.R.P. work, included the following tribute which I should like to share with you:

... I do not like, on occasions such as this, to pick out any classes or services for special

mention. All alike have shown the same qualities; London's debt is to all alike. But I must make one exception to this rule. I must pay a special tribute to the women. Their part in the battle has been one that is new for women, one for which women used not to be thought fitted—that of sharing with men the dangers and terrors of the front line. You all know the immortal laurels their heroism has won. I was talking, for instance, only yesterday, to a Chief Officer of one of our outer Fire Brigades for whom the outstanding recollection of one of our worst fires will always be the behaviour of the girls in the mobile canteen. "My God," he said, "they were magnificent. They kept in the thick of the fires; the bombs were falling all round them all night, but they never turned a hair, and always had a joke and a cheery word for our chaps." But there are, I expect, few of you who could not give testimony from what you have yourselves seen many a time. Women have shattered once and for all the curious but persistent illusion of us men that they are less brave than we are, and have placed us in the humiliating position of no longer being able to claim that we are superior to them in any respect. . . .

A personal greeting that I am also most happy to bring to you, the public health workers in the United States, is one sent you by Sir Arthur News-holme, the veteran leader and teacher of public health in England and America. I spent a weekend with him under special government permit in a war zone area on the southern coast of England, and he asked me to tell all his friends in America that he thinks of them frequently and wished to send them all his very best wishes.

Through Dr. John Grant, a classmate friend back in the early days at the School of Hygiene in Baltimore, I was

guided to a most interesting organization known as P E P (Political and Economic Planning) located close by the Houses of Parliament in London. This association and its monthly bulletin entitled "Planning" \* reflect perhaps the best thought for the future among the statesmen and thinkers of Great Britain. Issues of "Planning" have been devoted to "London Under Bombing" (February 17, 1941) and "Health in War Time" (April 29, 1941), and those whom I met in this worth while organization had this to say of the future of their country

The resistance to the best way is gone.

A selfcritical system is good.

There is an acceptance of change.

There is a great impetus given to the discovery of a better way.

In the past the government was criticised for doing something, now it is criticised for not doing something.

There are great promises of future changes. Everything at the present is in a fluid state.

And now the American Civilian Defense Mission must hurry home. It takes a land plane from the United Kingdom to Lisbon, it breakfasts there on August 16, and finds itself at La-Guardia Field in New York at 3 p.m. the next afternoon, and that with two hours out at the Azores and two hours again at Bermuda. It then reports to the Director and to the Chief Medical Officer of the Office of Civilian Defense in Washington.

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\* Annual subscription £1 a year. The Editor of "Planning," P E P, 16 Queen Anne's Gate, London S.W. 1, England.

# Silicosis and Other Health Problems of Metal Miners\*

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SILICOSIS and other forms of occupational diseases have long been known to occur among workers engaged in the mining of nonferrous metal ores. It is interesting to note that even as early as 1900 cases of silicosis, designated chalicosis pulmonum or chronic interstitial pneumonia, were described among Utah and Nevada metal mine workers.<sup>1</sup> Investigations near Joplin, Mo., in 1914 by the U. S. Bureau of Mines in coöperation with the U. S. Public Health Service indicated a serious problem of pulmonary disease among metal mine workers in that area.<sup>2, 3</sup> Subsequent investigations suggested a silicosis prevalence of 20 to 25 per cent among mine workers in this same region.<sup>4</sup>

The present report is based on a study of three representative metal mines in the State of Utah, which was made in 1939 by the U. S. Public Health Service in coöperation with the State Board of Health and the State Industrial Commission.<sup>5</sup> The immediate purpose of the investigation, of which this study forms a part, was to evaluate the various factors bearing on the health of Utah industrial workers, in order to secure information

which could be used as a guide in drafting legislation for the compensation of injury to health resulting from the exposure to occupational disease hazards. The long range objective was to suggest the measures necessary for the control and prevention of the health hazards which were found. Occupational and medical histories and physical and roentgenological examinations were made on 783 metal mine workers (90 per cent of the workers in these mines). Engineering studies were carried out in each mine to determine the environmental factors which might have a bearing on the health of workers engaged in specific occupations.

## ENGINEERING FINDINGS

All the establishments studied were underground mines extracting lead-copper or lead-silver ores, in which gold and zinc occasionally occurred in sufficient amounts to be considered as supplementary ores. They were selected to be representative of mining conditions which were cold and wet, hot and dry, and intermediate.

The principal factors to be considered in evaluating the hazard of dust inhalation were the nature and concentration of the dust in question, and the duration of exposure. In the engineering study it was found that underground metal mine workers were usually exposed to dusts containing between 20

\* Read before the Industrial Hygiene Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 15, 1941.

TABLE 1  
*Silica Content of Dusts in Three Metal Mines*

Location	Number of Samples	Per cent Total Silica			Per cent Free Silica		
		Maximum	Minimum	Average	Maximum	Minimum	Average
Ore milling processes*...	12	62.1	9.5	31.8	43.0	1.0	18.7
Mine airways .....	4	58.7	23.9	43.6	37.0	8.6	22.6
Mine development .....	4	99.0	24.1	57.9	99.0	2.0	41.3
Stopping (ore breaking)...	4	75.7	32.3	54.4	45.0	1.0	23.4

\* Eight of these samples were collected in ore sampling mills, bucking rooms, and crushing mills operated in conjunction with concentration mills or smelters.

and 40 per cent free silica (Table 1). Since most persons had worked in various locations in the mines where the rock encountered varied from silica-free limestone to nearly pure quartzite, it was possible that at times they had been exposed to atmospheric dusts having a much higher free silica content.

Particle size determinations showed that the dust suspended in the atmospheres of the three mines had a median diameter of 0.9 micron and that more than 96 per cent of the particles were of a size which might readily reach the smallest air sacs in the lungs.

Results of the determinations of the average dust exposure in certain of the more important occupations show that the underground occupations of miners, muckers, hoistmen, tool nippers, chute tenders, and timbermen, and the surface occupations of ore dumpers and buckers, have the highest concentrations of dust. In none of these does the weighted average dust exposure exceed 58 million particles per cu. ft. of air, whereas the numerically most important occupational group, representing 45 per cent of all metal mine workers, namely miners and muckers, showed a weighted average dust exposure of 23.1 million particles based on 139 samples. Approximately 86 per cent of all metal mine workers were found to be exposed to average dust concentrations of between 6 and 30 million particles per cu. ft. About 12 per cent were exposed to less than 6 million particles. High

dust exposures were usually associated with the drilling, breaking, and handling of ore. Ventilation with dust contaminated air in some stopes also contributed to the high dust concentrations encountered in these stopes.

Studies of ventilation and humidity were carried out, and exposure to various gases such as sulfur dioxide, carbon dioxide, carbon monoxide, hydrogen sulfide, methane, and others, was determined. It was found that toxic gases or atmospheres deficient in oxygen were present at times, but that such conditions were of a temporary nature so long as adequate ventilation was maintained. Accidents from this cause could be prevented by constant supervision and inspection of all working places. Extremely high and low temperatures (Table 2), rapid temperature changes, dusts of toxic metals, poor illumination, and inadequate sanitary facilities in the mines and in the surrounding communities were found to be potentially harmful to health in some instances.

A limited number of atmospheric samples which were analyzed for lead content showed that the workers in face operations and skip loading had an average exposure to about 3.7 mg. per 10 cu. m. of air, while other underground operators had an exposure to only 0.2 mg. per 10 cu. m. The high exposure of a lathe operator in a surface machine shop who was using a white lead cutting compound for machining threads is of special significance due to

TABLE 2  
*Psychrometric Observations in Three Metal Mines*

Mine	Dry Bulb Temperature (° F.)	Relative Humidity (per cent)	Air Velocity (ft. per min.)	Effective Temperature (° F.)
Mine 1				
Maximum .....	46	97	190	46
Minimum .....	43	66	20	37
Mine 2				
Maximum .....	71	99	105	71
Minimum .....	60	86	20	56
Mine 3				
Maximum .....	99	96	750	94
Minimum .....	78	40	25	65

the use of this process in defense industries, although it was an intermittent and nonsignificant exposure in the case presented.

Examples of good mining practice with regard to the control of the principal sources of dust indicated that the dust hazard could be greatly lessened

TABLE 3  
*Atmospheric Lead Concentrations to Which Workers Are Exposed in Three Metal Mines*

Operation	Number of Samples	Lead Exposure, in Milligrams of Lead per 10 Cubic Meters of Air		
		Maximum	Minimum	Average
Face operations and skip loading.....	24	13.5	<0.1	3.7
Other underground operations.....	8*	1.0	<0.1	0.2
Special surface operations †.....	1	...	...	6.5

\* Includes 4 samples collected in main haulageways and air returns with electrostatic precipitator.

† Sample collected beside lathe operator using white lead cutting compound while machining threads.

TABLE 4  
*The Effect of Good and Poor Practice on the Dust Concentrations to Which Metal Mine Workers Are Exposed*

Operation	Dust Concentration Million Particles per Cubic Foot of Air		Remarks
	Good Practice	Poor Practice	
Hand mucking:			
Wet stope .....	2	10	Lower concentration due to thorough wetting of muck pile and good ventilation.
Dry stope .....	5	105	Lower concentration due to thorough wetting of muck pile and adequate supply of fresh, clean air.
Mechanical mucking ..	3	142	High concentration due to dry mucking and supply of air from active stope.
Drilling .....	6	43	Amount of water, state of repair of drill, and ventilation affect dust concentration.
Bucking .....	..	33-80	Local exhaust ventilation system as operated was insufficient. Respirator necessary.
General air supply....	0.7	6-10	Effect of spray collectors and settling chambers in decreasing dust concentration.

by the proper use of present control measures such as wet methods, adequate ventilation, air cleaners or settling chambers, and local exhaust ventilation.

#### MEDICAL FINDINGS

The medical study of nonferrous metal mine workers included 783 persons, representing slightly less than one-fourth of the total number employed in this industry in the State of Utah as reported by the United States Census of 1930. All were males and nearly all were either native or foreign born whites. The age distribution of the group studied was similar to that shown in the Census for all Utah metal mine workers.

A detailed analysis was made of the medical examination findings for the 727 workers whose entire experience in a dusty trade had been in metal mines. The remaining 56 persons had previously worked for more than 2 years in a dusty trade other than metal mines; hence, their physical condition at the time of the examination could not be attributed entirely to experience in one industry.

The principal occupational disease found among these 727 metal mine workers was silicosis. As in previous studies made by the U. S. Public Health Service, as well as studies by other investigators, certain symptoms were observed more frequently in persons with silicosis. These included, in descending order of importance, dyspnea, frequent cough, productive cough, chest pain, and weakness. Seldom did all of these occur in any individual worker, but they often appeared in two's and three's, and in combination with other less frequent complaints.

*Incidence of silicosis*—The incidence of silicosis among workers in the metal mines is related both to the length of their employment in that industry and to the average dust concentration to which they have presumably been ex-

posed during all their working years in metal mines. Table 5 and Figure 1 show the result of grouping the metal mine workers according to weighted average dust concentration in arbitrary intervals of 6 million particles per cu. ft. of air. It will be observed that among the workers studied there were 66 cases, or 9.1 per cent, affected with silicosis. Of these cases 42 were first-stage and 24 were second-stage silicosis. No third-stage cases were observed. Forty-two others were considered as borderline silicosis.

There were only 3 cases of silicosis among the 137 persons who had been exposed, while employed in the non-ferrous metal mining industry, to an average dust concentration of less than 10 million particles per cu. ft. of air. Each of these 3 persons had worked 17 or more years in metal mines and probably had been exposed to much higher dust concentrations during certain periods in the past. Seventeen per cent of the 187 persons exposed to average dust concentrations of 24.0 million particles and over were diagnosed as silicotic. When years employed in metal mines, as well as dust concentration, are con-

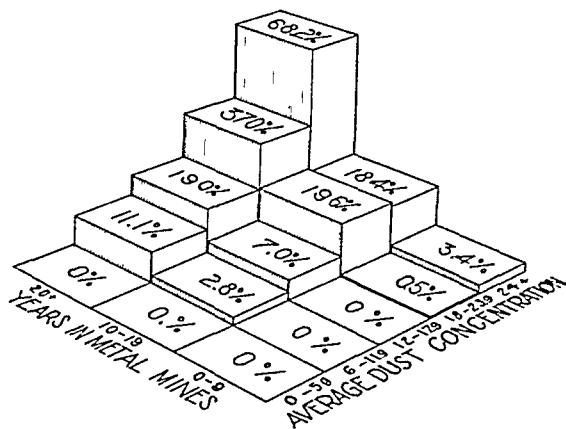


FIGURE 1—Relation of average dust concentration and duration of employment in the metal mines to the percentage of workers found to have silicosis (first- and second-stage).



TABLE 5

*Number and Per Cent of Metal Mine Workers with Silicosis According to Years Employed in Metal Mines and Dust Concentration*

<i>Dust Concentration, Million Particles per Cubic Foot</i>		<i>Years Employed in Metal Mines</i>			
		<i>Total</i>	<i>Less Than 10</i>	<i>10-19</i>	<i>20 and Over</i>
0 - 5.9	{ Number exposed . . . . .	39	17	11	11
	{ Number with silicosis . . . . .	0	0	0	0
	{ Per cent with silicosis . . . . .	..	..	..	..
6.0-11.9	{ Number exposed . . . . .	98	44	36	18
	{ Number with silicosis . . . . .	3	0	1	2
	{ Per cent with silicosis . . . . .	3.1	..	2.8	11.1
12.0-17.9	{ Number exposed . . . . .	115	51	43	21
	{ Number with silicosis . . . . .	7	0	3	4
	{ Per cent with silicosis . . . . .	6.1	..	7.0	19.0
18.0-23.9	{ Number exposed . . . . .	272	189	56	27
	{ Number with silicosis . . . . .	22	1	11	10
	{ Per cent with silicosis . . . . .	8.1	0.5	19.6	37.0
24.0 and over	{ Number exposed . . . . .	187	89	76	22
	{ Number with silicosis . . . . .	32	3	14	15
	{ Per cent with silicosis . . . . .	17.1	3.4	18.4	68.2
All dust concentrations *	{ Number exposed . . . . .	727	394	228	105
	{ Number with silicosis . . . . .	66	4	30	32
	{ Per cent with silicosis . . . . .	9.1	1.0	13.2	30.5

\* Includes 2 cases of silicosis among 16 workers with unknown dust concentration.

sidered, the prevalence of silicosis is greatly increased, reaching 37 per cent among those with 20 or more years' experience in an average dust concentration of 18.0 to 23.9 million particles and 68 per cent of those with 20 or more years' experience in an average dust concentration of 24 million particles and over (Figure 1).

Fourteen cases of silicosis, 5 of them with nodular lung-field markings were found among workers with less than 15 years' exposure. Comparatively little dry drilling has been done in Utah during the last 15 years. Yet, if one takes into consideration the dust counts observed during the environmental study, it is apparent that the control methods in present use are insufficient to prevent silicosis. However, if the dust concentration is kept below 10 million particles

per cu. ft. of air, it would appear that the silicosis hazard in these mines would be eliminated.

When employment in nonferrous metal mines is considered from the standpoint of occupation, it appears that the problem of silicosis is most serious for those men working at the face (*i.e.*, drillers, miners, and muckers). Among the group of metal mine workers who had been employed, principally at the face, for 10 years or more, 29.5 per cent were found to have silicosis, compared with 7.5 per cent among all other workers employed for this length of time. Only one of the persons with experience principally above ground was found to have silicosis. He had worked as a blacksmith for 23 years and during that time possibly had been exposed to free silica while sharpening

miners' tools. In addition to face workers, cases of silicosis were found in the five following underground occupations: mule skimmers, powdermen, pipemen, shift bosses, and timbermen.

Figure 2 shows the prevalence of silicosis among 385 persons employed principally at the face of nonferrous metal mines. It will be observed that when occupation remains the same, the per cent affected with silicosis increases rapidly with increasing years of employ-

ment. Whereas approximately a fourth of those who had worked for 6 or more years were affected, the percentage rose to 41 when only those men with 13 or more years of experience were considered. All 4 persons with more than 34 years' experience had silicosis.

From Figure 3, the relative importance among face workers of 3 employment duration groups may be determined. The group with less than 10 years' experience in metal mines, which

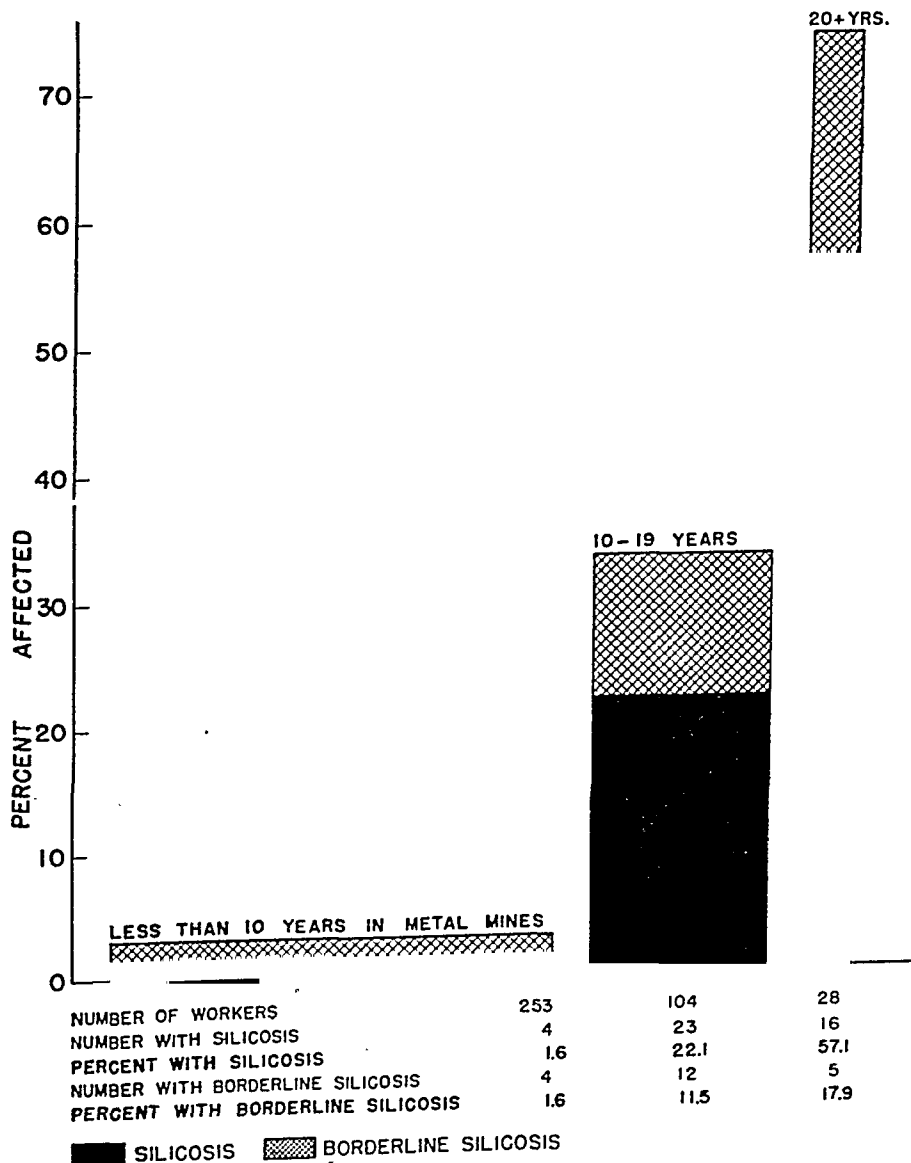


FIGURE 2—Percentage of face workers found to have silicosis, classified by duration of employment in metal mines. (Width of bar is proportionate to the total number of workers for the given periods.)

comprised two-thirds of all face workers, had only 1.6 per cent affected with silicosis. The other large group of face workers employed 10 to 19 years, presented a definite problem of silicosis with 22.1 per cent so affected, plus 11.5 per cent diagnosed as borderline silicosis. Three-fourths of the relatively small group of men who had worked 20 years or more had either silicosis or borderline silicosis. From this it is evident that even in a dusty occupation, such as face work, the hazard of devel-

oping manifest silicosis is pronounced only for persons employed over a relatively long period.

*Lead poisoning*—Lead poisoning ranked next to silicosis as an occupational disease of workers in the three nonferrous metal mines investigated. The health problem as regards lead among these mine workers, like the dust problem, seemed to be essentially one of face workers. Of the 727 metal mine employees examined, 102 gave a past history of acute episodes of lead intoxi-

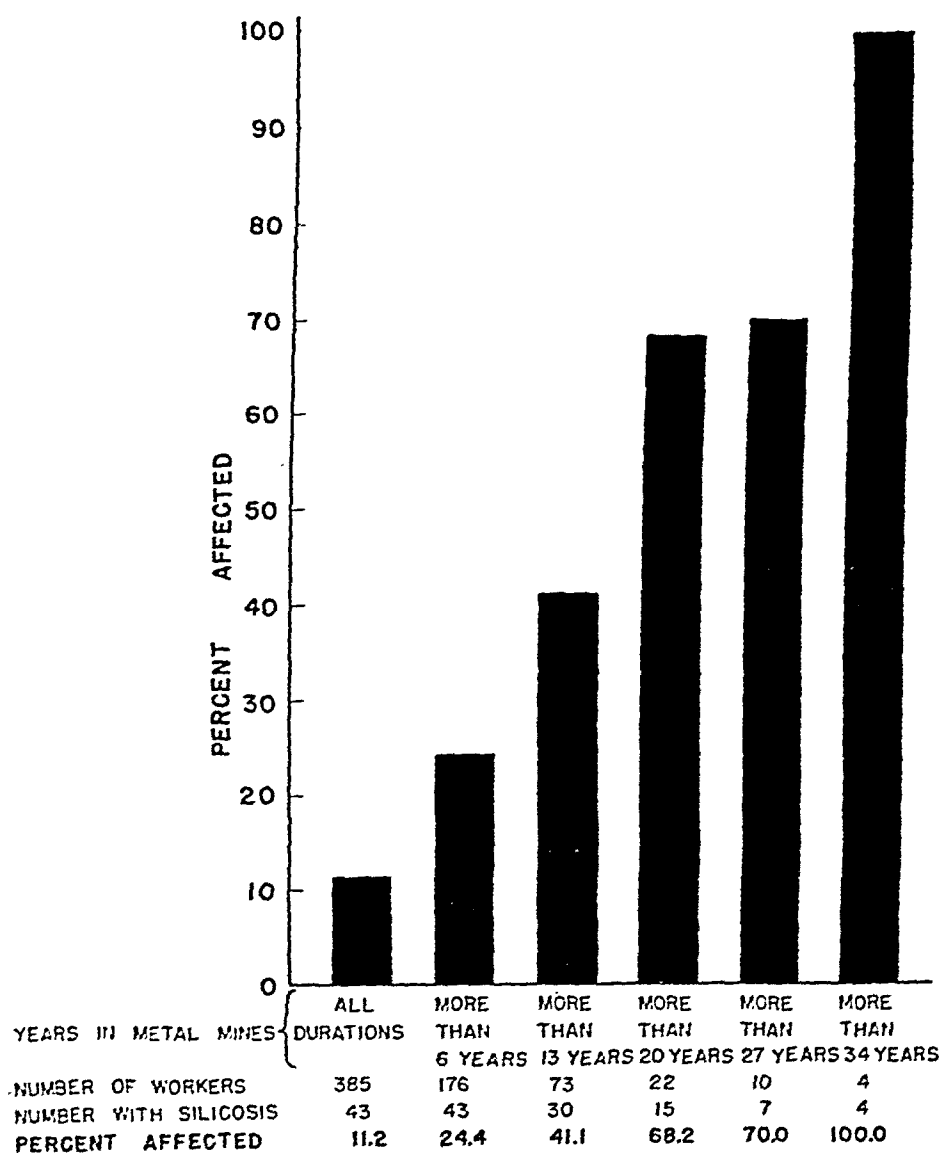


FIGURE 3—Percentage of face workers found to have first- and second-stage silicosis, classified by duration of employment in metal mines. (Numbers of workers are cumulated downward.)

cation. Nineteen of these men reported episodes within the past  $4\frac{1}{2}$  years. The duration of disability in recent years seldom exceeded 2 months and usually lasted only 2 or 3 weeks. The disabling symptoms were predominately of a gastrointestinal nature and were accompanied by a rise in stippled cell count and related erythrocytic changes. No instances of lead palsy or encephalopathy were reported.

At the time of the medical examination, 75 workers were diagnosed as having abnormal lead absorption (latent lead poisoning). Although the sense of well-being in these men was unaffected, each had a combination of 2 or 3 of the signs or symptoms associated with abnormal lead absorption. None was diagnosed as having lead intoxication.

Approximately one-half of the metal mine workers had a lead exposure exceeding the threshold limit of 1.5 mg. of lead per 10 cu. m. of air. The per cent of metal mine workers with exposure beyond this limit increased as the weighted average dust exposure increased. Thus, among all persons who had a weighted average dust concentration of less than 12 million particles there were 9.6 per cent. with a lead exposure beyond the threshold limit. Among those with dust concentrations of 12.0 to 17.9, 18.0 to 23.9, and 24.0 million particles and over, the percentage with lead exposure exceeding the threshold was 21.7, 62.9, and 74.9, respectively. This indicates that if the dust concentration is reduced to safe limits with respect to the hazard of silicosis, the danger from lead poisoning should also be reduced.

*Nonoccupational diseases*—The physical examination of these metal mine workers failed to reveal any diseases which appeared to be appreciably above the average prevalence found among other groups of male industrial workers. Eighteen metal mine workers had reinfection pulmonary tuberculosis, an inci-

dence of 2.5 per cent. In only 4 of these persons was the disease moderately advanced, while in the remainder it was quiescent, apparently arrested or healed. An excess of complaints of headache among face workers seemed to indicate poor ventilation. A few cases of mild dermatitis were attributable to contact with sulfide ores. The per cent of persons affected with the arteriosclerotic-hypertensive group of heart diseases showed the customary increase with age. Rheumatic heart disease was slightly more prevalent than usual. Only 6 cases (0.8 per cent) of the metal mine workers were found to have latent syphilis, which is less than one-half the estimated rate for the entire State of Utah. Injection of the conjunctivae was observed in 20.8 per cent, nearly the same rate as for Utah coal mine workers.

#### CONCLUSION

On the basis of the data presented, the following conclusions seem justified:

1. That in these Utah mines the prevalence of silicosis (9.1 per cent) is lower than in certain other areas where lead ores are mined. This is possibly due to a number of factors such as differences in the silica content of the ore and the nature of the mining operations.
2. That while the lead hazard in these mines is not especially acute, there is evidence that lead intoxication still occurs.
3. That if the atmospheric dust in these metal mines is kept below 10 million particles per cu. ft., no disabling silicosis should occur and morbidity from lead may also be expected to decrease.
4. That this reduction in the atmospheric dust concentrations can be accomplished by proper use of present control measures such as wet methods, adequate ventilation, air cleaners and settling chambers, and local exhaust ventilation.
5. That preemployment and annual medical examinations, including a technically good chest roentgenogram, should be made to detect cases of active pulmonary tuberculosis. These physical examinations enable the physician to detect such common ailments as high blood pressure, nephritis, diabetes, syphilis, and heart disease during their incipient stages and to

advise the worker on remedial measures. The annual examinations will also detect early silicosis and thereby call attention to deficiencies in dust control.

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# Food Poisoning Outbreaks Involving Smoked Fish—Their Epidemiology and Control\*

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FOR many years smoked whitefish, butterfish, carp and similar lightly smoked and salted fish have been articles of diet regarded as delicacies, particularly by certain nationalities and groups of people. The literature, however, contains practically no reference to either the occurrence of outbreaks of disease following ingestion of this type of fish or the degree to which the various processes of preservation prevent the growth of pathogenic organisms.

The investigation of two such outbreaks again points to the rôle that the epidemiologist, food technologist, and sanitary engineer can play in public health, particularly in preventing food poisonings through the proper processing and handling of food.

The study of these outbreaks indicates a definite food control problem

that may affect large groups of people over a wide area.

## FIRST OUTBREAK

During April, 1934, 32 residents of Brooklyn and Queens, and 2 visitors from Newark, N. J., became ill with symptoms of acute food poisoning, vomiting, abdominal pain, and diarrhea. Common to all the patients was the ingestion of smoked whitefish purchased through several retailers from a common wholesale smoked fish establishment in Brooklyn. One of the patients, a woman, aged 49, died two days after the onset of her symptoms, the cause of death being attributed, however, to chronic cardiovascular-renal disease. The remaining patients recovered completely after varying periods of time.

No specific food poisoning organisms could be isolated on bacteriological examination of the remaining samples of fish collected. However, several samples had high bacterial counts, the predominating organism being *Bacillus proteus*. This organism, although not considered pathogenic under ordinary circumstances, when it is found in food of this nature, may very well be responsible for food poisoning symptoms, and

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NOTE: Dr. Morris B. Jacobs performed chemical analysis for brine determination and assisted in writing the section on analytical results. Carolyn Oldenbusch and the staff of the Enteric Fever Laboratory performed the bacteriological examinations of the smoked fish samples and stools. Sol Pincus, Deputy Commissioner, gave valuable assistance and suggestions in the investigations of the outbreaks and the writing of this report.

the finding of the organism certainly indicates lack of proper handling of perishable food.

#### SECOND OUTBREAK

On July 16, 1940, several cases of acute gastroenteritis in Brooklyn were reported to the Department of Health. Within the next few days the reported cases rose to 47, in 18 separate families. Symptoms in all patients consisted of abdominal pain, diarrhea, and high temperature. In some cases, marked prostration occurred, and 6 persons were so seriously ill that they were removed to hospitals.

The others remained at home under medical care. Two of the patients died, one a boy of 5, who became ill on July 13 and died on July 17; the other, a man of 51, also became ill on July 13 and continued to have symptoms until July 28, when he too died.

It was quickly determined that the families affected had eaten smoked fish products purchased in 12 different Brooklyn neighborhood delicatessen stores. From these retail stores the source of the smoked fish was traced to a wholesale smoked fish establishment with retail outlets throughout Brooklyn. The smoked fish in question were whitefish, butterfish, and carp, and had been smoked at a plant in upstate New York, about 100 miles from New York City. It had been distributed both in that vicinity and to retailers in Brooklyn. After remaining in delicatessen stores for varying periods of time up to several days, this product, which is customarily eaten without any further cooking, was sold to persons who came down with symptoms of food poisoning within a few hours after consumption of the smoked fish.

As soon as the source of the fish was traced, inspectors of the Health Department embargoed smoked fish (approximately 1,000 lb.) from this plant found

in the retail outlets. This fish was later destroyed. At the upstate plant, the vats used for washing, soaking, and salting of fresh fish drained directly into a sewer line connected in common with a toilet drain. This sewer pipe emptied into a ditch close to the plant. A sample of the ditch water was found positive on bacteriological examination for *Salmonella typhimurium*.

Thus the stage was well set for contamination of the fish. Once such contamination occurred, and there is little doubt that it must have occurred on many occasions, the growth of pathogenic organisms would be uninhibited because of the lack of refrigeration and of a processing treatment designed to sterilize or preserve.

As soon as the first cases were reported, the New York State Department of Health was notified of the outbreak, and an investigation upstate also revealed that similar cases had occurred there.<sup>1</sup> Seventeen additional patients in 13 separate families were reported, making a total for the outbreak of 64 cases in 31 different families. The ages of patients ranged from 2½ to 60 years; there were 39 females and 25 males. Of the 64 patients, 10 were children. Except for the 2 fatal cases, the illnesses lasted for varying periods up to 2 weeks, with uneventful recovery. A typical history of one family involved was as follows:

Mrs. G. purchased smoked whitefish on July 15. The fish had no abnormal odor or appearance; at about 7 p.m. each member of the family had a similar portion. The same night, Arthur, aged 23, developed chills, vomiting, diarrhea, and a temperature of 104° F. The next day at noon, Mrs. G. became ill with similar symptoms; the day following, Mr. G. had acute diarrhea. The latter's condition became worse and he was taken to the hospital on July 18. Here his symptoms gradually subsided, and on July 27 his temperature became normal. In the meantime, Mrs. G. likewise had become worse and on July 22 was also admitted to the hospital, and recovered in 2 days. The third member

of the family was able to continue work in spite of slight diarrhea.

#### LABORATORY FINDINGS

Chemical examinations of all specimens of fish were negative for inorganic and organic poisons. Specimens for bacteriological examination included stools from patients and from foodhandlers in retail and wholesale establishments; samples of fish from homes of patients, retail stores, and wholesale plants. From all of these sources a similar organism was recovered, *Salmonella typhimurium*, as follows:

Patients (consumers) .....	14
Patients (retail foodhandlers).....	3
Patients (wholesaler) .....	1
Processor (not sick).....	1
Fish (whitefish, butterfish, carp)....	5

*Salmonella typhimurium* was first described by Loeffler in 1892, and classified by Castellani and Chalmers in 1919. It is also known as *Bacillus aertrycke*, *Bacillus pestis caviae* and *Breslau's bacillus*, and its occurrence is widespread throughout the animal kingdom. According to Bergey,<sup>2</sup> it is a natural pathogen for guinea pigs, sheep, parrots, turkeys, canaries, chickens, ducks, and pigeons, and has been responsible for numerous food poisoning outbreaks. In fact, it is one of the most common food poisoning organisms found in group gastroenteritis outbreaks, and has been described as found in foods such as meats and duck eggs. Smoked fish, however, has not previously been reported as a vehicle for this organism.

In addition to finding *Salmonella typhimurium* in the stools of patients and in the infected food, search was made for it in the stools of the foodhandlers who did not become ill. A processor who had no symptoms at any time was found to have the organism in his stool. A sample of smoked whitefish taken at the out-of-town plant was also positive for *Salmonella*

*typhimurium* and, as previously mentioned, a sample of water taken from the ditch draining the toilet was similarly positive for this organism.

#### PATHOLOGY

Autopsy<sup>3</sup> on the 51 year old fatal case revealed that the entire gastrointestinal tract exclusive of the stomach had small areas of superficial hemorrhage. There was marked desquamation of the mucosa of the ileum; some areas were a dark greenish brown in color with numerous scattered hemorrhages. There were no gross ulcerations, no lymphoid hyperplasia, and no enlargement of the mesenteric lymph nodes. The large bowel showed moderate congestive changes and small areas of scattered hemorrhage on the mucosa. In addition, there was congestion of the spleen, adrenals, liver, and kidneys. *Salmonella typhimurium* was isolated from the lung.

#### HOW THE FISH WAS PROCESSED

The whitefish and carp were received at the out-of-town smokehouse from firms in New York City, in fresh condition, packed in cracked ice. These fish were first washed in running water to remove slime and dirt. The butterfish were received frozen and were first thawed in a barrel into which flowed a continuous stream of cold water. After the preliminary processes, the fish were eviscerated by hand and placed in a 10 per cent brine solution for 6 hours at room temperature. They were next hung on small hooks attached to wooden rods for 3 hours to dry at room temperature, and then put into a smoking compartment where drying was continued over burning charcoal at a temperature of about 90° F. for 2 hours. Finally the gas burners were turned on and the heat in the smoking compartment was slowly raised so that at the end of 6 hours the temperature of the smoke chamber was 138° F. The tem-



perature of the fish after this interval in the smoke-house averaged 120° to 130° F. The smoking process was completed by igniting hard wood shavings which glowed for 1 hour. The fish were then removed from the smoking oven, cooled at room temperature for several hours, then graded and packed in paper lined wooden crates. If not shipped out immediately, they were placed in the refrigerator until needed.

The daily mean temperature in and around New York City during the period of the outbreak ranged from 67° to 75° F. with highs of 80° on July 14, and 83° on July 16. The smoked fish were distributed to various stores and hotels in trucks without ice. The sun beat down on these trucks, and in most instances the fish were allowed to remain for several hours in the hot trucks before distribution to the retail stores where there was further lack of the elementary care for a perishable foodstuff. It was a common practice for retail stores to display smoked fish on counters without refrigeration, at times even under bright electric lights. The fish from the up-state plant were also delivered in a non-refrigerated truck to Brooklyn for subsequent distribution to the New York City retail stores.

#### STUDY OF FISH PROCESSING

Old methods used for the processing of fish are still in use today. Among these are drying, salting and smoking. When originally practised, these processes served to dehydrate the fish and thus inhibit bacterial action. The primary purpose of smoking fish is the preservation of the fish; the secondary purpose is to increase its palatability. The greatest preservative action of the smoking process results from the drying and dehydrating action of the heat, rather than from the bactericidal properties of the chemical preservatives in the smoke. These chemical preserva-

tives formed from the burning of hard wood for the production of smoke have not been completely identified, since different woods and conditions of burning will yield smokes of different composition. Among the substances formed are formaldehyde, wood creosote, phenols, guaiacol and pyroligneous acid in quantities not sufficient to sterilize. All these, together with the soot from the smoke, impart a characteristic flavor to the fish.

Smoking of fish does not sterilize it. In 1934, Griffiths and Lemon<sup>4</sup> showed that fresh haddock had bacteria counts varying from 14,000 to 860,000 per gm. When these fish were hot-smoked for 4-5 hours at a temperature of 185° F. to 203° F., the counts varied from 0 to 2,100 bacteria per gm. Some samples of the fish cold-smoked at a temperature of 100° F. for 4 hours gave counts which varied from 5,300 to 3,000,000 per gm. It is therefore apparent that a significant destruction of bacteria occurs only when fish are subjected to hot smoke.

In order to determine the bactericidal action of the smoke itself, these investigators hung a brined haddock in a smoke-house which was smoke free, for the same length of time as in the cold-smoked process. This fish gave a bacterial count of over 200 million per gm. The smoked haddock had a count of 62,000 per gm.

To find out whether the hot smoke had any greater bactericidal effect, they heated the fish to 195° F. under the same conditions as if the fish were being smoked, but without any smoke being supplied. These fish showed a final count of 75,999 per gm. as compared with only 104 per gm. on a similar run with smoke. These experiments demonstrated that the smoke or some constituents of it were more effective as the temperature was increased.

The function of salt in the preservation of fish, other than its effect on

flavor, is mainly to abstract water from the tissues, with consequent inhibition of bacterial action. As the fish are salted or soaked in brine solution, water passes from the fish into the brine, diluting it. Simultaneously some salt passes into the tissues of the fish. When the concentration of the salt absorbed by the flesh has become high enough, the cells shrink because of the loss of a portion of their water. For the salt to have some preservative action of itself, its concentration in the tissues should be at least 4 per cent, since it is only at this concentration that salt inhibits the growth of most bacteria and retards enzymic autolysis. Concentrations below 4 per cent have little or no preservative action because all bacteria require salt for adequate metabolism; some bacteria even grow well in a one to two per cent brine solution.<sup>5</sup>

Griffiths and Lemon<sup>4</sup> in their studies on haddock used a 10 per cent salt solution for brining. To every 25 lb. of fish, 50 lb. of this solution were used. Samples of the fish examined bacteriologically showed that brining with a 10 per cent salt concentration did not materially reduce the number of bacteria present. As a matter of fact, in 8 samples out of 16, the bacteria count after the brining was increased which is not surprising in light of Yesair's work in 1930.<sup>6</sup> He examined a number of salt samples and found as high as 1,470 bacteria per gm. in salt.

In order to understand the situation as it exists in New York City, certain trade and economic factors in the production and sale of smoked fish in the metropolitan area must be taken into consideration. The consumer in this area, according to the trade, strongly dislikes a highly salted fish product. Furthermore, drastic dehydration of fish in the smoking process produces a low yield of smoked product. Hence the manufacturer tends to decrease the

length of time and temperature of the actual smoking process. Both of these practises minimize preservative action by reducing the dehydration effect which would ordinarily be accomplished by adequate salting and smoking.

In order to ascertain the amount of salt which would be absorbed in fish tissue in the brining process used by fish plants in New York City, a series of experiments was performed. The analyses were performed upon the fleshy portion of the fish, as the best means of estimating this penetration. The analysis for chloride was made according to the following method.<sup>7, 8</sup>

Chloride expressed as sodium chloride may be estimated by simple titration with standard thiocyanate solution. Weigh 10 gm. of the flesh portion to the nearest 0.01 gm. into a 250 ml. Erlenmeyer flask. Add 25 ml. of 0.1 normal silver nitrate solution and then 20 ml. of concentrated nitric acid solution. If this quantity is insufficient to precipitate all the chloride as silver chloride, add an additional known volume of 0.1 normal silver nitrate solution. Boil gently on a hot plate, until all solid matter is dissolved except silver chloride. Cool, add 50 ml. of distilled water; 5 ml. of a saturated solution of hydrazine sulfate to remove any nitrous acid formed; 5 ml. of a saturated solution of ferric ammonium sulfate as indicator; 1 ml. of nitrobenzene for each 0.05 gm. of chloride; and titrate the excess of silver with 0.1 normal potassium thiocyanate solution until a permanent light brown color appears. Subtract the ml. of 0.1 normal thiocyanate solution used, from the ml. of 0.1 normal silver nitrate solution added to the fish, and calculate the quantity of chlorine as sodium chloride. With a 10 gm. sample, each ml. of 0.1 normal silver nitrate is equivalent to 0.058 per cent sodium chloride.

These results are tabulated in Tables

1 and 2. The fish take up salt, and continue to take up salt as long as they are soaked in brine solution. The brine solution drops rapidly in salt content for the first few hours, and then more slowly. This brine solution also dissolves some protein from the fish. The strength of the original brine solution used in pickling the whitefish was about 11.4 per cent. Analysis of the fleshy portion of three samples of a finished smoked whitefish product showed a salt concentration ranging from 1.8 per cent

one in Kiel of gastroenteritis due to the ingestion of smoked mackerel. The onset of symptoms occurred soon after consumption of the fish. The smoked mackerel were infected with *Salmonella enteritidis*. The source of the fresh mackerel was Denmark, shipped in iced packages to Kiel and other parts of Germany for smoking. The fish had no abnormal odor or appearance when consumed. The clinical picture in the patients was severe diarrhea, vomiting and fever.

TABLE 1

## Salt Content of Whitefish on Soaking in Brine Solution

Sample No.	Length of Time in Soak	Strength of Brine Solution Per cent	Salt Content of Fish Per cent	No. of Determinations
BK 105Z	Fresh	11.4	0.08	6
BK 109Z	5 hours	7.1	0.44	4
BK 111Z	7½ hours	4.6	0.58	4
BK 113Z	10 hours	5.2	0.87	4

TABLE 2

## Salt and Protein Content of Fish Brine Solution

Sample No.	Sp. Gr. 60° F.	Salt Content Per cent	Approx. Salometer Reading	Protein Content Per cent
BK 104Z	1.088	11.4	45	none
BK 108Z	1.052	7.1	28	0.60
BK 110Z	1.047	5.6	22	1.39
BK 112Z	1.045	5.2	21	1.47

to 2.1 per cent. This concentration, as noted above, is insufficient to have an inhibiting action on the growth of most bacteria in the fish.

These experiments show that under the methods used for brining and smoking in New York City, no great concentration of salt occurs in the flesh of the fish. There is, therefore, little or no preservative action.

## PREVIOUS SMOKED FISH OUTBREAKS

A review of the literature reveals no previously recorded outbreak of food poisoning from smoked fish infected with *Salmonella typhimurium*. The only other outbreak reported due to smoked fish was noted by Bitter<sup>9</sup> who reported

## DISCUSSION

*Extent of Problem*—Smoked fish are consumed in large amounts by Scotch, Russian, German, Scandinavian, and Jewish groups. The figures for production of smoked whitefish and butterfish by states as given by the United States Division of Fishery Industries for 1939,<sup>10</sup> the last year for which complete statistics are available, are given in Table 3.

*Hazard*—New York City consumes over one-third of the entire annual production of smoked whitefish and butterfish. The importance of keeping such food articles safe for human consumption in and around New York City is manifest. In certain sections

TABLE 3  
*Domestic Production of Smoked Whitefish and Butterfish*

	<i>Whitefish</i> <i>Lb.</i>	<i>Butterfish</i> <i>Lb.</i>
Massachusetts	221,000	.....
New York	824,000	413,400
New Jersey	.....	65,500
New Jersey and Pennsylvania	257,000	.....
Pennsylvania	.....	17,820
Maryland	39,500	51,000
Michigan	65,163	.....
Massachusetts, Connecticut, Illinois, Michigan and Ohio	.....	18,000
Ohio, Illinois and Indiana	46,000	.....
Wisconsin and Minnesota	241,500	.....
Nebraska and Tennessee	64,000	.....
	<hr/> 2,758,963	<hr/> 565,720

of the city, these products form a regular part of the diet of many families. To a lesser extent this condition prevails in many other large cities, and is, therefore, a problem of some magnitude from the public health standpoint in other parts of the country.

Changing the operating practices of an industry is a slow process. Persistent efforts on the part of health officials and the coöperation of the more progressive operators have caused food industries to yield to the acceptance of higher standards of sanitation. There seems to be no reason why improved methods and progressive changes may not be expected of the smoked fish industry. With respect to the education of the consuming public, they can likewise be made to recognize the fact that smoked whitefish, butterfish, and similarly processed fish are perishable foods and require refrigeration and the utmost care in handling.

#### CONTROL MEASURES

There are 14 wholesale smoked fish establishments under Health Department permit in New York City, each of which was carefully inspected for rat haborage, insanitary conditions and equipment, and unsatisfactory operating methods. Each plant was studied

to determine the methods employed in manufacture and transportation of the finished product.

Trucks were examined for refrigeration facilities, and temperature readings were made of storage compartments of each truck. Corrective measures were taken where unsatisfactory conditions were reported, and frequent periodic reinspections were made and a careful control record was maintained. No attempt was made to change the character of the finished product, since the market demands a slightly salted and lightly smoked fish.

In addition, a complete list of 698 retail outlets is on file. Each retail dealer on this list was visited and his establishment inspected. The storage and display facilities at each location were checked, and the internal temperatures of the fish in storage and on display were taken. All dealers were informed of the requirements of the Sanitary Code of the City of New York, that all perishable foodstuffs must be properly refrigerated at a temperature of 50° F. or less at all times.

Good coöperation was obtained from manufacturers and dealers with respect to refrigeration of smoked fish. There still remains the problem of educating

the consumer to the fact that the refrigeration and careful handling of smoked whitefish, butterfish, and similar types of fish is necessary until ready for consumption.

#### RECOMMENDATIONS

Since lightly smoked and lightly salted smoked fish is perishable, and readily serves as a medium for the growth of pathogenic organisms, it should be treated as such a type of food product, and the carrying out of the following precautions is indicated:

1. The building in which the food processing takes place should be of sanitary construction throughout, with walls, floors, and ceilings made rat-proof and readily kept clean.

2. There should be facilities for sterilization of all utensils and equipment which come in contact with the products, and the cleaning and gutting of fish should be done under a constant and ample flow of potable water.

3. There should be an adequate and suitable sewage disposal system and sanitary plumbing to protect the products. Live stock and other animals should not be permitted on or near the premises.

4. All workers engaged in the processing phases of this industry should have regular medical examinations, including laboratory tests when such are indicated. Cleansing of the hands, especially after visiting the toilet, cannot be over-stressed.

5. Only salt which has been redissolved and purified after an initial mining or crystallization should be used in making up the brine solutions for processing these products.

6. The brining process should be carried out under adequate refrigeration, that is, at a temperature of 50° F. or below.

7. Preliminary drying of the fish prior to smoking should be accomplished as quickly as possible with the aid of rapid circulation of warmed air.

8. Adequate refrigeration of 50° F. or below should be provided at all subsequent stages of storage, transportation, distribution, and retail display.

9. Efforts should be made to educate the consumer with regard to the perishable nature and disease hazards of this type of food.

#### SUMMARY

Two outbreaks of food poisoning traced to smoked whitefish, butterfish, and carp are described. Bacteriological, epidemiological and public health aspects are discussed, and recommendations for the proper preparation, storage, and refrigeration of this perishable product are offered. Control measures instituted in New York City are outlined.

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# How Important Is the Dental Health Program?—Nationally? Locally?\*

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THE problem of dental health is complex and confusing to both professional and lay groups responsible for community programs. An answer to the assigned question "How Important Is the Dental Health Program?" may be influenced by the interest and understanding of persons who discuss the subject.<sup>1</sup> A negative response may suggest a background of experience in which either there was a lack of effort to develop a constructive program or an absence of careful study and wise planning. In either situation, we are reminded of the statement "Religion has failed" when perhaps Religion has not been tried.

There is an abundance of facts to show the need of more and better dental care. The public is aroused by the findings of Selective Service Boards which show that the largest number of deferments due to physical conditions is because of dental deficiencies. Whether the seriousness of such defects is greater than at the time of the previous examinations of drafted men may be open to question. Dental decay is the most prevalent physical defect among school children. Dental defects were the most frequent of physical defects found during examinations for the National Youth Administration.

That the dental conditions of college men are superior to those of the rank and file is noted by examiners for Selective Service. Brekhuis reports,<sup>2</sup> however, that the freshmen at the University of Minnesota in 1939 had poorer teeth than did those in 1929; there was a significant deterioration of first and second molars, and some deterioration of premolars; in both years, the boys had better teeth than the girls. It is somewhat disconcerting to learn that "these same 1939 freshmen who showed poorer dental health than the 1929 students were certainly not in any worse general health than the 1929 group; in fact, they were perhaps a little better." But there are many factors which influence the health of individuals including not only the dental status, but also early conditions for mental and physical growth and development, protection from communicable disease, and promotion of sound health practices. Consequently attention must be given to both personal and public health in a broad program which embraces maternal and child health, control of communicable disease, sanitation of the environment, nutrition, adult hygiene, industrial hygiene, mental hygiene, housing, and health education.

As recognized by the National Dental Hygiene Association, the problem of dental health is not restricted to the indigent, although this group usually shows a higher proportion of defects

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than persons in the higher income brackets. Strusser reports,<sup>3</sup> for example, . . . that studies of adolescents and adults on relief showed that 66 $\frac{2}{3}$  per cent needed either one or two dentures to restore masticating efficiency; that dental conditions of white collar workers show effects of neglect; and, referring to conditions of our Selective Service registrants and applicants for enlistment, he states, "If the foregoing is the condition of the cream of the population, certainly the men in the defense program are no better fit dentally, and certainly it must be agreed that serious dental handicaps may affect health and cause loss of time in industry and the concomitant disruption of a well regulated production plant where every man and every hour counts, and especially where every man has his particular job to do."

Much of the problem lies within the average home of the country, as judged by figures from the U. S. Public Health Service:

a. Twenty-two per cent of the people go to a dentist for all or part of the necessary service.

b. Fifty-eight per cent of the people can afford all or some dental service but do not seek any dental service.

c. Twenty per cent of the people cannot afford dental service and may be considered as the dentally indigent for whom service must be provided by others.

Studies show that most children have one or more decayed teeth, and that the teeth of children under 14 years of age are decaying six times as fast as they are being filled. Wisan properly emphasizes,<sup>4</sup> that without long range and specific objectives, "where dental services are provided by selecting the worst cases, by waiting for tooth aches, and by giving older children the preference, one finds many permanent teeth lost. Studies indicate when dental treatment during the first two school grades is neglected, 7th and 8th grade children show an average of two to three lost permanent teeth per child." On the other hand, in such communities as Hackensack (N. J.) and Clark Township (N. J.), where emphasis has been placed on the lower grades, less than

one permanent tooth is lost for every two children.

In Honolulu, where a carefully planned program of education and service has been conducted for 20 years, extractions of permanent teeth of clinic children in the first 6 grades of school have shown a striking drop, reaching during the past 5 years an average of 5 to 7 per 100 children, while fillings have slightly increased. Furthermore, in 1940, nearly 76 per cent of the 19,614 school pupils enrolled in public elementary schools had their mouths put in "perfect" condition, while 14 per cent were attending dentists when schools closed, leaving only 10 per cent who did not go to dentists during the year. Many of the 10 per cent arrived in the Territory only recently, including children transferred to Honolulu from rural areas where it has been more difficult to obtain dental service. Of the children whose mouths were put in perfect condition, half were attended by private dentists; most of the children still under treatment were going to the offices of private dentists.

A survey of Mouth Hygiene Programs for School Children in cities of the United States was conducted in 1936 by the Cleveland Child Health Association. In 64 per cent, of the 309 cities for which information was clearly given on the subject, the programs were administered by the Department of Education; in 28 per cent, by the Department of Health; in 6 cities there was joint responsibility between these two departments; while the Dental Society or the Parent Teacher Association or private foundations carried the burden in the remaining cities.

In 104 cities out of 354 where dental inspections were made, the dentist was responsible; in 91 cities there was a combination of personnel engaged in this activity; while in 52 the work was done by a dental hygienist; in 41 by a physician; in 64 by a nurse; and in 2

by teachers. Naturally the percentage of children found to need attention varies not only by the type and extent of the program, but also by the type of examination, personnel employed, and grades covered. Procedures and organization vary widely.

In addition to the confusion as to what is embraced in a sound and adequate program of dental health are the questions of cost and of personnel. A recent report by the Economic Committee of the American Dental Association is revealing. In this study of dental needs of white adults in the United States, 55,000 questionnaires were sent to 11,000 dentists of whom over 1,600, or about 15 per cent, responded by returning 7,541 schedule cards. While recognizing limitations of this study, the committee reported that less than 2 per cent of the cases had never previously visited a dentist, that only 3.2 per cent needed no dental care other than prophylaxis, that the average need for males was 4.3 fillings and for females 4.4 fillings (ages 15-19 years 6.8 to 6.5 respectively), that the average need for extractions and for full dentures (closely related factors) increases with age, being in general greater for males than for females, that (varying with income groups from the lowest to the highest) 22 to 44 per cent of the males visited the dentist within the previous year, and that the average length of time since the last visit to the dentist (varying with income groups from the lowest to the highest) was from 3.1 to 1.7 years, the period being slightly longer for males than for females, but not varying significantly by age groups. The committee reported as the average cost of restoring the mouths of white persons 15 years of age and over who go to a dentist, determined on the basis of specific dental need, \$48.96 for males and \$45.43 for females. If these figures are applied to the white population of the United States, the cost involved

would be over four billion dollars; the cost for the city of New Haven where I am directly concerned as a Commissioner of the Board of Health would be over five million dollars.

Let us consider also the cost of a program for children utilizing the experience of Honolulu which has perhaps the most adequate program in the United States. This service was stimulated by the financial assistance of the Strong Foundation which aided in the training of dental hygienists and largely supported the Strong-Carter Dental Clinic. The cost of operation of the clinic in 1940, serving roughly half of the school children treated, was \$53,874, providing for 16,310 dentists' working hours, for 8,548 children who made 34,826 clinic visits. This is exclusive of a comprehensive and correlated program of dental health education conducted by dental hygienists and teachers in the schools.

What proportion of a community health budget should be devoted to dental health? We need more information on this question. In the Boston, New Haven, and Los Angeles County Health Departments, the proportion is around 5 per cent. In New Haven, recommendations of the local dental committee for additions would raise the proportion to 13 per cent. Seven years ago the Board of Supervisors of Santa Barbara County, Calif., reinstated a dental hygiene service for school children at a cost of about \$3,500 per year which seems to be yielding favorable results in supplementing the services of private dentists. The community budget needs in different communities will vary. Furthermore, not only the percentage of the budget but also the total amount provided for all health purposes in relation to resources of the local community and of the state, as well as possibilities for state and federal aid in certain instances, must be considered.

Dental health education programs



should be integrated with the general health education programs for all age and functional groups. Strusser advocates dental health service for children between the ages of 2 and 14, numbering 24,000,000, and, on a long range basis, estimates that it would require a 37,500,000 hour program over a period of years to reach the maximum efficiency for this group and continue the plan on an adequate basis. This would require 25,000 of the 70,000 dentists in the United States working on a basis of 1,500 hours per year. "That does not mean regimentation or socialization. The dental program of the community may include education for all and service only for the indigent or dentally indigent. However, it would take 25,000 dentists that amount of time to accomplish this task whether it were paid for by individual families or by communities for their indigents. Of course, the program would use other personnel for administration, supervision, and follow-up."

If 25,000 dentists were employed for this service, 45,000 would be available for the other age groups numbering approximately 90,000,000 (eliminating age groups below 2 and above 65), or a ratio of 1 to 2,000. But if only 20 per cent of the population go to the dentist in any one year, the ratio would be one dentist to 400 persons. "Eventually," says Strusser, "the program would be entirely preventive and the growth of the profession would be promoted to the extent of providing personnel on a 100 per cent basis, or a ratio of one dentist to 1,000 persons—the same ratio as in military services in peacetime."

An important feature of an adequate dental program is the provision of qualified personnel. There seems to be a difference in opinion among dentists, educators and public health workers as to the place of the dental hygienist. Should the dental hygienist be chiefly an assistant to the dentist, or should she

also occupy an important place in dental health education? What position should the dentist occupy in administration and in health education? Part of the confusion relates to the basic preparation and fitness of those who have engaged in this work, coupled with a changing emphasis in school health programs.

In Honolulu, where the carefully selected dental hygienists have had extensive training in education and in oral hygiene, besides a college background, the hygienists determine the eligibility of all first grade children for service at the dental clinic operated in good quarters at Palama Settlement. The hygienists' examinations in school bring to light unhealthy oral conditions which might escape unnoticed, because many are thus examined who would not voluntarily go to a dentist for periodic examinations; and the educational work done individually at the chair has proved of great value. In the classroom, the hygienist teaches general health habits, mouth health, and nutrition with emphasis on local foods economically and readily obtained. These talks are made interesting by means of charts, posters, models, and motion pictures. In the Territorial Department of Public Instruction 25 hygienists and one supervisor are employed for 164 public elementary schools in the whole area, giving prophylactic treatments and examinations to children enrolled in grades 1-4, with examinations only to children in grades 5-6, in schools of Honolulu. In a number of rural areas self-supporting dental clinics have been established in the schools where needy children have been cared for by dentists of the locality at a reasonable fee. In California, dental health instruction is also usually given by dental hygienists who are well trained for this service.

But conditions and resources vary. For example, a dental health program in the public schools of North Carolina

was instituted by the State Board of Health in 1918, and a Division of Oral Hygiene was created in 1931. Directing its major endeavor along educational lines in the elementary schools this division has, in addition to a director, a staff of school dentists and an educational consultant. The dentists' activities include instruction of children in the classrooms. It should be noted that the school dentists are not only trained in the profession of dentistry, but also in the art of teaching and in child psychology. To reinforce and follow-up their teaching, the dentists have some graded educational material, prepared by the educational consultant to leave with the teachers.<sup>5</sup> After teaching in each of the elementary grades, the dentists inspect the mouths of all children under 13 years of age, and make necessary dental corrections for the underprivileged children. The parents of the other pupils who need dental attention are notified of this through the mail and are advised to consult their own dentists. For this latter group no diagnoses are made. The teachers classify the children as to their parents' ability to pay for their dental work. The corrective work for the underprivileged children is termed demonstrative teaching. As in most of the counties the dentists can visit each school only once in every two years, the burden of responsibility for teaching mouth health rests with the classroom teachers. Seventy-five of the 100 counties in the state participate, each bearing one-half of the expense of the program, the State Board of Health defraying the other half.

In New Jersey, where Wisan has conducted a carefully planned program for several years, the State Department of Health disseminates educational material stressing the importance of making dental health a specific objective. In order to show how preventive services improved dental conditions, the department has planned five demonstration

programs, aided by local health committees, in a small industrial community, in rural areas, and in a large city. Using these demonstrations as a means of obtaining definite and practical information, the department is confident that in the near future it will be in a position to:

- a. Inform local communities how dental health may be made a specific objective
- b. Give proof of the effectiveness of a preventive dental service program
- c. Inform administrators just what can be considered adequate funds for an effective dental program

It has become increasingly clear that our dental health education programs must include provision for dental service. As stated by Millberry,<sup>6</sup>

Filling cavities in decayed teeth is a commendable procedure, in fact it is the only known procedure which will restore function and aid in preventing the recurrence of the disease. All investigators who have been interested in solving the problem of dental caries, even the nutritionists who once believed that it was just a diet problem, are now agreed that the pit and fissure cavities in the teeth must be filled by the dentist. These represent about 62 per cent of the total number of decayed teeth on the average and caring for them early in the life of the child is the most effective means of tooth conservation. This is not, however, an absolute preventive measure because teeth will decay around fillings just as they will if sound. Our dental health education programs must, therefore, make provision for dental service in the form of examination of the mouth and teeth, mouth hygiene or prophylaxis, filling of cavities in restorable teeth, and extracting those which are no longer useful or are a menace to health.

Twenty-seven years ago dental scientists from various parts of the world prepared addresses to be delivered at the Sixth International Dental Congress scheduled to be held in London on August 4, 1914. While not delivered because of the First World War, these addresses were later published and revealed ambitious plans for universal service for the care of children's teeth

in all civilized countries through some form of organized state service. After 1914 in several countries, not only in some totalitarian states but also under several democratic governments, the government took over, in whole or in part, the task of caring for children's teeth. In 1934, Sir J. A. Young, Minister of Health for New Zealand, wrote in his foreword to a booklet on school dental service, "Recognizing that prevention is better than cure, it became obvious that the surest means of combating this menace (dental disease) to the general health of the people was to begin with the children, and the Government of the Dominion therefore commenced, some years ago (1921), to build up a system of school dental clinics." A progressive drop in extractions resulted.

In conclusion, there is ample evidence to indicate the need throughout the country for a dental health program soundly conceived, adequately supported, and ably executed. Programs have been developed in several areas after careful study and planning which seem to be eminently worth while. A reasonably effective program in most local communities and states, however, is yet to be provided. While recognizing that conditions vary in different localities, much remains to be clarified in regard to essential elements of a community program beyond the recognition in somewhat general terms of the importance of a threefold approach through: (a) extension of scientific dental research, (b) dental health education, and (c) dental service. Adequate dental care includes daily dental hygiene and regular visits to the dentist. To accomplish this goal, there must be constructive long-range plans developed on the basis of determined needs and resources, qualified personnel, and adequate budgets.

Dental educational campaigns apparently fail to reduce the percentage of dental caries unless professional dental care is also provided. In view of the

magnitude of the task and of the relative returns for funds and energy expended, emphasis at the outset should be given to a solid foundation of work with children, gradually extending the age level above and below the first two grades as resources permit. While this is a major community problem, the program should be geared in reasonable balance with other educational, health, and welfare activities. Many local communities and several states lack sufficient financial resources to meet the problem without state and federal aid. One of the subjects for further study is the proper proportion of the budgets to be used for this purpose, in addition to continuing appraisal of methods of organization and administration. The employment of dentists skilled in work with children is essential.<sup>7</sup> The educational and guidance programs must be increased in effectiveness. Persons engaged in dental health education must have special training for the task, and methods must be periodically evaluated.

Coöperative planning and action should be strengthened through the formation and stimulation of local, district, and state dental health advisory committees or councils composed of representatives of all agencies concerned with this problem. Several national agencies are equipped to render helpful advisory services and to give other assistance.

Both dentistry and public health have made great advances and significant contributions for public good. With further progress in research and in education, the opportunity for improved, and expanded service will doubtless increase. Can advances in the sciences be translated into further social benefits, through the prevention, control, and treatment of oral disease? Will professional groups adjust to their responsibilities and grow in usefulness for social good? Shall we meet our joint responsibilities? It is up to you and me to do our part in the study

and development of this important enterprise.

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# Shall Public Health Physicians Attempt to Assess Nutritional Status of School Children?\*

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THE answer to the question "Shall public health physicians attempt to assess nutritional status of school children?" will depend on what the individual answering the question considers the ultimate function of the school physician to be; on whether he believes nutritional status lends itself to clinical evaluation; and lastly, it will depend on how fine or exact an appraisal is to be made. It is obvious that an examination of all the problems involved in answering these questions is beyond the scope of this paper. I shall limit myself, therefore, to a brief discussion of why and how I think a public health physician should attempt to make clinical evaluations of the nutritional status of school pupils. The opinions which I have on the subject are based on my own experience in attempting to ascertain the physical fitness of a group of over seven hundred 6 and 7 year old children attending school in New Haven in 1934-1936.<sup>1</sup>

*Why should the physician attempt to assess nutritional status of school children?*

First let us consider why the physician should attempt to assess nutritional status. Ordinarily a physician

has one of two purposes in mind when he makes a physical examination: either he wishes to discover whether disease or abnormality is present, or he wishes to secure information which may be compared with information secured at a previous examination. Likewise the school physician should evaluate the nutritional condition of a school child for one of two reasons: either that he may discover whether the child is suffering from some disturbance of nutrition, or that he may have information which will enable him to say whether the child's nutritional state is better or worse than at some former time.

But, one may argue, why should one attempt to make an assessment or try to compare an assessment made at one examination with that made at another, when we have no accurate and objective means for judging nutritional status at our disposal and when clinicians frequently fail to agree in their judgments. Those who believe that a clinical appraisal is of slight or no value because it is a subjective evaluation and one affected by the experience and interest or even the emotional and mental state of the observer, have many studies to support their contentions.<sup>1, 2 \*</sup> On the other hand, it has seemed to me that in recent years too much stress has been placed on the inaccuracies of the clinical method and too little said

\* Read before the American School Health Association and the Food and Nutrition and Maternal and Child Health Sections of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 17, 1941.

\* An extensive bibliography is found in reference 1.

as to what can be learned, in spite of these inaccuracies, from such an evaluation.

In attempting to make clear why I think a clinical assessment of nutrition is valuable, I should like to point out the value of the physical examination in assessing health and disease. It is a common experience among physicians to discover that when several examine a patient or a group of patients they will not all agree regarding the size or condition of the tonsils or regarding the findings in the chest or abdomen. Because this fact is true regarding the general physical examination, should we consider that such an examination is useless and ought to be discarded completely? I believe most of you will agree that too much valuable information can be obtained from the careful physical examination to discard it—at least until such time as we have a simpler, more accurate, and less expensive method to replace it.

*How accurately is the school physician able to evaluate nutritional status?*

The argument advanced to prove the usefulness of a general physical examination can also be used to show the value of clinical methods in appraising nutritional status or in diagnosing specific nutritional disorders. The trained and careful observer, for example, is able to recognize rickets with considerable accuracy without resorting to the use of laboratory procedures. Moreover, such an observer is able to appraise fairly well, if he observes a rachitic child over a definite period, whether or not this particular disturbance is becoming more or less severe. While it is true that even the most experienced physicians may disagree regarding the presence of or the degree of rickets, I believe most of you will agree that the clinical method of diagnosis is accurate enough for routine examinations of children. The more

precise laboratory procedures used in diagnosis may be reserved for children who on clinical examination show signs suspicious of rickets or for cases in which one wishes to secure accurate information regarding the severity or progress of the disease.

Perhaps the following illustration will show even more clearly why I believe the clinical method of evaluating nutritional status is valuable, and what I think the limitations of such an evaluation are. The analogy chosen deals with the sense of sight and is, I believe, comparable in a way to the clinical appraisal of nutrition—an assessment which is based in large measure on visual impressions. Most individuals have, for example, learned to distinguish quite accurately the colors red, blue, and a mixture of these colors, violet. If however, we mix red and blue in many different proportions, we will obtain a number of shades of violet with red at one end and blue at the other end of the series. The more we increase the number of shades the more difficult it becomes for an individual to place correctly a given shade in its proper place in the series, and the more disagreement there will be among a group of individuals called upon to identify the same shade. It would seem that we might conclude from this example that while it is possible to identify distinct colors with enough accuracy to make them of use as colors, we cannot break them down into too many shades and still expect the observer to be accurate in his judgment of them.

Just as training enables an individual to distinguish distinct colors and a number of shades of these colors, so training and experience enables most physicians to develop a fairly accurate concept of what can be considered as good, or fair, or poor nutritional status. On the other hand, clinicians not uncommonly find that the more grades

of nutrition are increased or subdivided, the more difficult it becomes for a physician to know whether to place a subject in a certain grade or in one only slightly above or below, and the greater the inconsistency in judgments when several clinicians are asked to assess a particular individual. This illustration tends to show, I believe, that the classification of nutritional states into a few large grades can be done with enough accuracy to make a clinical evaluation a useful tool. We should remember, however, that we should not attempt to show too fine or exact grades without expecting to find a decrease in the accuracy of our judgments.

#### *How can the physician best assess nutritional status?*

If we accept the tenet that evaluations of nutritional status should be made, we are at once confronted by the question as to how such estimates can be made more reliable and hence more valuable than they are at present.

Perhaps the first requisite in making a reliable appraisal is to make a careful examination. Such an examination requires time, a requirement which has been ignored so frequently in school examinations that many observers have been led to question whether such examinations were of enough value to continue to make them. It would seem a better health program if the usual hasty routine examinations of school children could be replaced by a more careful examination (allowing at least 20 minutes for the examination) and by follow-up of children who presented health problems or needs. If such a program were instituted, the physician would then have enough time at his disposal to see and to evaluate the various items such as fat, or weight, or history of diet and disease, which must be considered if anything approaching a reliable assessment is to be made.

The second requirement in making a

reliable clinical judgment of nutrition is to be as objective as possible. The amount of fat and the amount and tone of the muscle are perhaps the most objective items in the physical examination and should be estimated with care. Height and weight too are objective items which are of value, especially when they are considered in relation to race and body-build. Items such as the color, the condition of the hair and skin, the condition of mouth and teeth, and the posture are more difficult to evaluate, but even these, if observed carefully and related to the other findings, are useful in the evaluation of nutritional status.

The third requisite for a reliable clinical appraisal is to examine at repeated intervals children who present suggestive signs of nutritional disturbance. Accurate records of weights and heights taken by the school nurse or other trained personnel, and complete records of the physical findings of the physician over a period of observation help us greatly in deciding at any given examination what the physical condition of the child is, and also whether a child is in need of closer medical supervision. For instance, if one were asked to judge the nutritional states of two 6 year old children who presented similar clinical findings, he would be in a position to make a more accurate evaluation of each child if it were known that one had gained only 1 pound in the preceding 6 months whereas the other had gained 5 pounds. In this connection may I stress again the value of using growth records and of comparing a child with himself rather than with other children in arriving at a reliable clinical estimate of a child's physical condition.

#### *The value of the past history*

Another valuable asset in making an accurate evaluation of nutritional status and one too little used in many school

examinations is the past history of the child. If school examinations were done only in the presence of a parent or other responsible member of the family, so the examiner could learn whether the child under consideration had been ill or well, or whether he had good or poor dietary habits, or whether he was overactive or inactive, the clinician would obviously be in a better position to make a reliable assessment of the child than if he had no such history. One of the children examined in the study to which I referred at the beginning of this paper demonstrated to me the importance of history and growth records in assessing nutritional status and in deciding whether medical supervision was needed. The child when examined at 7 years of age presented nothing unusual except that his nutrition was low borderline. Two months later he died of a brain tumor. Since nothing was learned at the time of the physical examination that was of benefit to the child, the examination might as well not have been done. However, had I made the examination in the presence of the mother and learned that the boy was having headaches and attacks of vomiting, and had I availed myself of the child's weight record which showed a gain of only 2 pounds in the previous year, I would have had information that would have been invaluable in helping me to arrive at a more accurate assessment of the child's nutritional condition and of his general physical state. In other words, I would have been in a position to know that the boy needed further medical supervision, and I would have fulfilled by this additional information the function for which I assume school examinations are intended.

And finally may I stress the importance of trying to maintain a constant picture of what constitutes good, fair, and poor nutrition, in order that clinical judgments of the item may be fairly

accurate and consistent. Many physicians who are called upon to examine school children have had a wide experience in observing sick children but have had relatively little opportunity to examine the healthy child or to see good or optimum development. And, on the other hand, the physician whose time is given over entirely to school work may forget to what extent physical handicaps or disease may affect the child's well-being. Undoubtedly the accuracy of judgment of both groups of physicians would be improved if each could continuously have the chance to examine and evaluate both sick and well children. Clinicians, too, have observed that if one examines large numbers of children of the same race or of similar social and economic levels his concept of the different nutritional grades may be distorted.<sup>3, 4</sup> For example, if one examines only children in an area of economic depression, he may see so many poorly nourished children that he begins to think of poor nutrition as being average or usual and of average or borderline as good or excellent. This type of error could, I think, be largely eliminated if physicians doing routine school examinations were not assigned to particular areas in a community but were moved about frequently from one area to another in order that they might see children of different racial and socio-economic groups, and might thereby be able to keep in mind fairly accurate pictures of what constitutes good, borderline, and poor nutritional states.

#### SUMMARY

1. The clinical assessment of nutritional status of school children should be made since such evaluations, carefully done, are still our best single means of determining the nutritional condition of the children.

2. It should be remembered in using the clinical method of assessment that it is a crude method, and that it does not lend itself



to the classification of nutritional states into too fine grades.

3. The accuracy of the clinical method is increased by making the examination as objective as possible, and by taking into consideration the disease, dietary, activity, and growth history of the child.

4. The present widespread practice of examining large numbers of school children in short periods of time should be abandoned. The practice is not valuable from the standpoint of the children, the school, the parents, or the physician.

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# Problems in the Laboratory Diagnosis of Rabies\*

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THE diagnosis of rabies in the laboratory is based entirely upon the microscopic demonstration of Negri bodies and upon animal inoculation. The demonstration of Negri bodies is the method of choice since the diagnosis can be thus made in a few minutes or hours. When the technic employed demonstrates typical bodies the result is highly convincing and satisfying. However, negative and doubtful results leave much to be desired, and animal inoculation must be resorted to. The difficulties in demonstrating Negri bodies arise from two sources of error which can be enumerated as inability to differentiate them from other inclusion bodies and cell structures, and inherent deficiencies in the methods of examination.

## NEGRI BODIES, LYSSA BODIES, AND OTHER BODIES

The large Negri body with the inner structure well developed and stained is easily recognized by any microscopist who has seen a few demonstrations. No long years of experience are required since the difficulty lies not in the recognition of the typical body but with its demonstration. Negri<sup>1</sup> described the body as occurring in two forms, one in which the inner bodies are small and highly refractile and another in which they are larger, less refracting, roundish,

oval, or irregular. In one phase of their development the cytoplasm encloses a mass of minute inner bodies which when they are distributed through the central nervous system in single units cannot be differentiated from the granular structure of the cellular elements. Since the identity of the Negri body is not yet understood, its development is not known. However, every experienced microscopist has encountered the difficulty of deciding whether the bodies observed in some preparations are Negri bodies or cytoplasmic structures normal to the cell or if not normal at least only distorted cellular structures. Goodpasture<sup>2</sup> refers to the variation in size of Negri bodies and speaks of being able to demonstrate the smallest forms. When small bodies are associated with large ones, which show the typical inner structure, no confusion is encountered. When, however, only forms so small occur that the demonstration of the "Innenkörper" is doubtful, the diagnosis is doubtful. The brain of cats, particularly, offers difficulty because of the pink staining granular material in the cells and also because the Negri bodies in the pyramidal and Purkinji cells of this animal are often very small. The failure of the microscopic diagnosis of rabies as proved by mouse inoculation is shown in Table 1.

It is not always because of the size of Negri bodies that satisfactory demonstration fails. There do occur in

\* Read before the Laboratory Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 16, 1941.



rabid animals bodies described by Goodpasture<sup>2</sup> as "lyssa bodies." These bodies differ from Negri bodies in size and the absence of "Innenkörper." They are described as very small, pink staining, homogeneous spheres. They are found with and without recognizable Negri bodies. In those brains containing no unmistakable Negri bodies these bodies are the cause of much confusion in the diagnosis. Animal inoculation is the only method by which the diagnosis in such cases can be made. Because the microscopic diagnosis was indefinite in some cases we injected mice with material from 76 animals which had been reported as Negri-positive or doubtful. As shown in Table 1, only 66 of these animals proved to have rabies by mouse injection. Additional experience with this discrepancy does not assist in its prevention since we find instances where rabies virus is associated in the brain with eosinophilic bodies that are not Negri bodies.

As a result of this experiment we were prompted to examine for eosinophilic bodies the brain from apparently well cows and sheep that were killed at a local packing plant. Sections were prepared from portions of the hippocampus, cerebral cortex, cerebellum and medulla. In the medulla and cerebral cortex we were able to demonstrate large and small bodies which took the eosin stain. These bodies were both intracellular and extracellular. They were for the most part homogeneous but sometimes there was a small dark staining granule in the center. These bodies resemble "lyssa bodies" more than Negri bodies. Since Goodpasture demonstrated that "lyssa bodies" are homogeneous, and since bodies demonstrated in the brain tissue of normal animals and animals suspected of having had rabies have the same homogeneity and staining reaction, even the most experienced observers cannot make a decision without mouse inoculation.

#### SMEARS—IMPRESSIONS AND SECTIONS

Sellers<sup>3</sup> reported that 40 of 46 laboratories questioned about the methods employed to demonstrate Negri bodies used smear or impression. Only 2 laboratories used paraffin sections. When typical Negri bodies are present these preparations are satisfactory. In our experience typical Negri bodies are often scarce and difficult to demonstrate in the brain tissue of hogs, cows, horses, and cats. In paraffin sections hundreds of cells can be examined quickly, and in properly fixed and stained preparations the sections are clear and there is good visualization of the structures of the cells as well as small Negri bodies. The importance of the examination of large numbers of cells from different parts of the brain and cord is emphasized by the wide distribution of the virus in the brain. In a study of 84 Negri-positive brains we found Negri bodies in the cerebral cortex alone in four instances (Table 2). In a com-

TABLE 2

#### *Distribution of Negri Bodies in Brain*

	<i>Brains</i>
Hippocampus only . . . . .	8
Hippocampus and cerebral cortex . . . . .	13
Hippocampus, cerebrum and cerebellum . . . . .	24
Hippocampus, cerebrum cerebellum and medulla . . . . .	31
Hippocampus, cerebrum and medulla . . . . .	1
Hippocampus and cerebellum . . . . .	3
Cerebral cortex only . . . . .	4
Total . . . . .	84

parison of the direct smear method with paraffin sections we found that in 10 per cent of the cases the sections were Negri-positive when the smears were negative. In no case were the sections negative when the smears were positive.

The chief objection to sections is that they are time consuming and offer more technical difficulties than smears do. However, the delay in the diagnosis occasioned by sections is not significant. At the longest it is never more than a few hours. When the incubation period of the disease is considered, even the

matter of a day is not important. If the acetone fixation described by one of us (Stovall<sup>4</sup>) is used, the sections are ready for examination in 3 to 5 hours. The small pieces of tissue can be left overnight in the acetone but they are ready for embedding in paraffin within 2 to 3 hours, depending upon the size of the pieces of tissue. It is not unusual for us to have the sections ready for examination in the late afternoon when specimens are received in the forenoon. It is our practice to prepare smears as soon as the specimen is received, and if they are Negri-negative, sections are examined before animals are inoculated. The technic is not complicated or laborious, and the equipment is nothing more than is found in most laboratories.

#### STAINS

In our hands eosin-methylene blue is the most satisfactory stain for the demonstration of Negri bodies in routine diagnostic work. One of us has shown the importance of dissolving the dyes in a solution in which a low pH is maintained. The study showed that 1 per cent eosin (yellowish) in 95 per cent alcohol maintained at pH 6 stains Negri bodies a pale pink; at pH 3.0 the large and small Negri bodies stain a uniform deep red. The counter stain was methylene blue adjusted between pH 5.0 and pH 6.0. As the pH of the methylene blue rises above pH 6.0, more and more of the eosin is removed from Negri bodies until at pH 8 the small bodies cannot be seen and the large and more typical ones are pale and atypical. This destaining action of the methylene blue solution as it approaches neutrality seriously interferes with the visualization of Negri bodies. When eosin and methylene blue are maintained at the optimum pH the cytoplasm of the nerve cells takes a diffuse pale blue color and the body of both the small and large Negri bodies a deep red. The inner structure of the Negri bodies appears as

dark blue granules. In the small ones there is often only one small granule. The "lyssa bodies" are a homogeneous red color.

Sellers<sup>5</sup> has recommended basic fuchsin and methylene blue in an alcoholic solution for smears and impressions. Because we have found eosin-methylene blue used as described above so satisfactory for paraffin sections, we have also used it for smear preparations.

#### ANIMAL INOCULATION

Above we have mentioned the occasional occurrence of what appear to be "lyssa bodies" or small Negri bodies in the brain of some animals which did not produce rabies when injected into mice. These bodies are found most frequently in the cerebrum and medulla. Since in the study of 84 cases of rabies proved by mouse inoculation we found Negri bodies only in the hippocampus 8 times and only in the cerebral cortex 4 times (Table 2), the finding of *eosinophilic bodies* in any portion of a brain from an animal suspected of having had rabies creates a doubt as to the diagnosis. In all such cases we have injected mice, as well as in all cases that were clearly Negri-negative. Thus in Table 1 it will be seen that of 354 animals found to be Negri-negative or doubtful only 310 were rabies-negative by mouse inoculation, giving a failure in the microscopic diagnosis of 12.43 per cent. While this is in apparent close agreement with the report of Leach,<sup>6</sup> it may not be comparable. There are several reasons for this. In the first place the total number of examinations made by us is less than the number made by Leach. Probably more important than this is the difference in the variety of animals represented and the number of each variety.

Sometimes specimens are received that are badly decomposed and for that reason they have been unsatisfactory for microscopic examination.

The intracerebral injection of mice with contaminated brain tissue invariably causes death of the animals from bacterial infection. To avoid this Sulkin and Nagle<sup>7</sup> investigated a number of bactericidal agents in which they immersed the contaminated tissue. They did not try filtration because reports indicated that this method was unsatisfactory for a health department laboratory. However, we have used filtration through Seitz filters, size No. 3, with all specimens showing contamination or which were decomposed. Mice inoculated with filtrates from typical Negri-positive brains have not failed to develop rabies. The organism which invariably causes purulent meningitis in mice is a small Gram-positive bacillus. We have not had time to work with this organism, and so far we have made no attempt to identify it. In our hands the Seitz filter removes these bacteria and the filtrates are highly satisfactory for intracerebral inoculation of mice.

Small portions of hippocampus, cerebellum, cerebrum, and medulla are emulsified in 10 ml. of sterile saline. If the smears or sections reveal bacteria, the emulsion is passed through the filter and mice injected with 1/100 to 3/100 of a ml.

Of particular interest is the result of mouse inoculations with emulsions from 24 specimens in which small

atypical inclusion bodies were found in the cerebral cortex. In 5 instances the bodies were considered characteristic enough to consider the microscopic examination to be Negri-positive. In only 1 of the 5 was rabies virus demonstrated. The remaining 19 specimens were considered doubtful by microscopic examination. Of these, 9 were rabies-positive and 10 were rabies-negative. From these results it appears that by microscopic examination of sections and in some smears we are able to demonstrate eosinophilic bodies resembling "lyssa bodies" and atypical Negri bodies which are not associated in the brain with rabies virus. Also the results show that brain specimens in which the microscopic examination leaves the diagnosis in doubt contain rabies. The bodies that cause this confusion in the microscopic diagnosis of rabies are similar to ones found in certain parts of the brain of normal cattle and other animals and to atypical or small Negri bodies.

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# Studies on the Single Injection Method of Canine Rabies Vaccination\*

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IN view of the notable degree of protection against rabies afforded dogs by a single 5 ml. injection of commercial chloroform-treated vaccine containing  $33\frac{1}{3}$  per cent brain material, as reported in a previous paper,<sup>1</sup> it was deemed advisable to repeat this experiment. In order to eliminate, as far as possible, variability due to differences in age and batch of vaccines and test virus inoculum, such as occurs when several successive small groups of animals are used for a study of this kind, the experiment herewith reported was undertaken with a single large group of dogs.

The question has arisen in regard to the chloroform-treated vaccine as to whether it was the use of this particular chemical inactivating agent or the high brain concentration which was responsible for the considerable degree of protection obtained by us in dogs vaccinated with this preparation.<sup>1</sup>

In order to answer this question we requested a commercial house to provide us with chloroform- and phenol-treated vaccines of identical brain concentration. These were tested in parallel.

Rabies vaccines deteriorate rapidly

when not kept in cold storage. It was thought that freezing and drying the vaccine in vacuum might obviate the necessity of cold storage. To determine this point we also tested chloroform-treated vaccine of the same lot number which had been subjected to freezing and drying in vacuum.

Experimental studies comparing the efficacy of the single subcutaneous method of vaccination with commercial chloroform-treated canine vaccine containing  $33\frac{1}{3}$  per cent brain material and phenol-treated vaccine containing 20 per cent brain material have already been reported.<sup>1, 2, 3</sup> In our experience the chloroform-treated vaccine has proved to be the more efficacious of these preparations in preventing rabies in the dog when given one month preceding an experimental inoculation of street virus. These studies are summarized for comparison with the present experiment.

## MATERIALS AND METHODS

As in our previous experiments, the dogs used were purchased from owners and data were obtained as to breed, sex, and age. None of the dogs had been previously vaccinated.

The average age of the vaccinated animals was 17 months, while the average age of the control group was 18 months. The vaccinated dogs had an average weight of 23 pounds as compared to 19 for the controls.

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The studies and observations herein reported were conducted with the support and under the auspices of the International Health Division of The Rockefeller Foundation and the Alabama State Board of Health.

A total of 135 dogs was used. These were divided into the following groups: 34 which were vaccinated with the liquid chloroform-treated vaccine, 33 which received the frozen and dried preparation, 32 which were given the phenol-treated vaccine, and 36 which remained unvaccinated.

To reduce the occurrence of infectious diseases among the dogs they were kept in small units, with not more than two dogs to a kennel, until they had survived longer than the usual incubation period of rabies. The use of wooden gratings for the floors eliminated clinical coccidiosis infections.

The commercial house which supplied the chloroform-treated vaccine used in a previous experiment furnished the two vaccines employed in this study.

The chloroform-inactivated vaccine was prepared from the brains of sheep killed when prostrate with fixed virus rabies. After homogenization and dilution to a  $33\frac{1}{3}$  per cent suspension in normal saline the material was filtered through a wire sieve. Chloroform was then added to a strength of 1 per cent. The vaccine was subsequently kept at refrigerator temperature and shaken for a 10 minute period, three times a day for 30 days. The material was homogenized November 13, 1940. The animal inoculation test for the presence of live virus was performed January 13, 1941, and was negative. The expiration date was given as November 13, 1941.

The phenol-inactivated vaccine was made from the brains of horses killed when prostrate with fixed virus rabies. Normal saline containing 1 per cent phenol was added to make a 40 per cent brain suspension. This material was homogenized, filtered, and subsequently diluted with normal saline to make a final brain concentration of  $33\frac{1}{3}$  per cent. The phenol content of the final product was 0.83 per cent.

After homogenization the vaccine was kept at refrigerator temperature. It was shaken three times during the first 24 hours for 10 minute periods and once daily for a 15 minute period for the next 6 days. The vaccine was negative for active virus when tested by animal inoculation 2 weeks after homogenization. The expiration date was given as February 5, 1942. Both vaccines were also tested for active virus at this laboratory by intracerebral inoculation into mice. The vaccines were injected undiluted and diluted 10 fold and 100 fold in broth, tyrode solution, and distilled water. We were unable to demonstrate active virus in either vaccine.

#### FREEZING AND DRYING

The apparatus for freezing and drying was constructed after the method described by Bauer and Pickels.<sup>4</sup> The vaccine was tubed in 5 ml. amounts in 25 ml. round bulb Pyrex ampoules. These were subjected to quick freezing in a carbon dioxide ice and alcohol bath. Following this the material was maintained at  $-25^{\circ}\text{C}$ . during the entire process of dehydration. This consisted of 72 hours on vacuum and a 24 hour period connected to a phosphorus pentoxide trap. The ampoules were sealed when thoroughly dry with the vacuum partially replaced with nitrogen. The vaccine was rehydrated 12 days after dehydration and used immediately. The rehydrated vaccine was negative for active virus by intracerebral mouse inoculation.

All vaccinated dogs were given a single 5 ml. dose, 2.5 ml. being injected subcutaneously on either side of the cervical spine.

The virus used for test inoculation was obtained from a dog dying of rabies after exposure in nature. This brain had been stored in pure glycerin in an ice cream hardening cabinet at  $-25^{\circ}\text{C}$ . for 5 months. At the time of



inoculation the entire brain was weighed and, after thorough trituration, was diluted 1:10 by weight in distilled water. This suspension was centrifuged at about 2,000 r.p.m. for 10 minutes, and the supernatant fluid was used as the street virus inoculum. The test virus was injected immediately after preparation and kept at icebox temperature during this procedure. When all of the dogs had been inoculated serial 10 fold dilutions of the virus-containing material were injected intracerebrally into white mice. By this method the titer was found to be  $10^{-5}$ .

Three groups of vaccinated dogs were given the test virus 31 days after vaccination. The control dogs were tested at the same time as the vaccinated animals. An injection of 0.5 ml. of the 10 per cent test brain suspension was

given into each masseter muscle. Animals surviving the test virus inoculations were held for a period of at least 90 days.

Of the original 135 dogs, 9 died of extraneous causes, leaving 126 for calculation. Autopsies were performed on all dogs dying of rabies and other causes, as well as on those killed at the end of the retention period. The brains were examined for Negri bodies and if none were found a 10 per cent suspension of a pool of various portions of the brain was inoculated intracerebrally into white mice.

## OBSERVATIONS

The results of this experiment are set forth in Table 1, which also includes summaries of our previous experiments.

All dogs killed at the end of the 90 day survival period were Negri

TABLE 1

*Comparison of the Results Obtained in Four Experiments on Commercial Canine Rabies Vaccines*

	Vaccinated			Control			Statistical Significance
	No. of Dogs	Died of Rabies	Per cent Dead of Rabies	No. of Dogs	Died of Rabies	Per cent Dead of Rabies	
Experiment 1 Commercial phenol-treated vaccine containing 20% of brain material, given in a single subcutaneous injection of 5 ml. ....	105	26	25	120	66	55	0.0000
Experiment 2 Commercial phenol-treated vaccine containing 20% of brain material, given in a single intraperitoneal injection of 5 ml. ....	52	19	37	63	34	54	0.0933
Experiment 3 Commercial chloroform-treated vaccine containing 33⅓% of brain material, given in a single subcutaneous injection of 5 ml. ....	50	2	4	55	34	62	0.0000
Experiment 4 Commercial chloroform-treated vaccine containing 33⅓% of brain material, given in a single subcutaneous injection of 5 ml. ....	32	2	6	36	20	56	0.0001
Frozen and dried chloroform-treated vaccine containing 33⅓% of brain material, given in a single subcutaneous injection of 5 ml. ....	27	7	26				0.0362
Commercial phenol-treated vaccine containing 33⅓% of brain material, given in a single subcutaneous injection of 5 ml. ....	31	3	10				0.0002
Totals .....	297	59	20	274	154	56	

\* By corrected  $\chi^2$  test. Likelihood of getting a difference as great or greater than that observed in the mortality of the vaccinated and the control groups by chance alone.

negative, and no virus was demonstrable in any instance by the intracerebral mouse inoculation test.

In the group vaccinated with the liquid chloroform-treated material only 2 of 32 dogs died of rabies (6 per cent); and of the 27 dogs given the same vaccine after it had been frozen and dried in vacuum and rehydrated, 7 died of the disease (26 per cent). Three of 31 dogs vaccinated with the specially prepared phenol-treated vaccine contracted rabies (10 per cent). The mortality rate in the control group as a result of rabies test virus inoculation was 56 per cent, 20 of the 36 dogs inoculated having died of the disease. The percentage mortality in the control group of this experiment is strikingly similar to that of previous studies. This is further evidence of the generally uniform results obtained by this method of test virus inoculation in unvaccinated, control animals if the number of animals tested is large enough to give statistically significant results.

TABLE 2

*Variation in Mortality Rates in Small Groups of Control Dogs Following Experimental Inoculation with Rabies Street Virus*

Group No.	Number of Dogs	Rabies	Per cent
I .....	10	3	30
II .....	10	4	40
III .....	11	10	91
IV .....	8	3	38
V .....	8	6	75
VI .....	9	5	56
VII .....	8	4	50
VIII .....	7	4	57
IX .....	11	10	91
X .....	10	2	20
XI .....	8	3	38
XII .....	10	6	60
XIII .....	10	6	60
Total ....	120	66	55

The principal criticism of the studies on canine rabies vaccines reported in the literature is the lack of sufficient test animals in potency tests using the

same method of vaccination and test virus inoculation. This is especially true of control groups. Table 2 gives the mortality figures for the control dogs in the 13 groups of animals tested in a previous study.<sup>2</sup> There was a marked variation in the mortality rate in the various control groups, but when these were considered as a whole the mortality rate for the control animals was very nearly the same as that obtained in other experiments (Table 1). This illustrates the variation due to chance, and emphasizes the necessity of considering this factor in planning such tests. When the same experimental procedure is repeated until the total number of vaccinated and control animals satisfies statistical requirements an accurate result is obtained. A good example of this is the almost identical result obtained in our two studies of chloroform-inactivated vaccine. In the one<sup>1</sup> we used repeated, small, approximately equal groups of vaccinated and control animals. The other consisted of a single test of large groups, as reported in this paper.

TABLE 3

*Mortality Rate According to Age in 265 Unvaccinated Dogs Following Experimental Inoculation with Rabies Street Virus*

Age	Number	Rabies	Per cent
months			
1-6 .....	24	21	88
7-12 .....	121	81	67
13-24 .....	67	33	49
Over 25 .....	53	18	34
Total .....	265	153	58

Table 3 is included to illustrate the variation in mortality rate of four different age groups of control dogs tested by the same method of inoculation with rabies street virus.

There was no statistical difference in the degree of immunity produced in dogs by chloroform- and phenol-inactivated vaccines when these contained the same concentration of brain material.

## SUMMARY

A second experiment to verify results of a previous study of chloroform-treated vaccine was performed. In both instances this type of vaccine produced a high degree of immunity in the dog. The results of the two experiments were practically identical.

No statistical difference in antigenicity was obtained where chloroform and phenol were used as inactivating agents in the preparation of canine rabies vaccine when the brain material was of the same concentration.

The antigenicity of chloroform-treated vaccine was reduced by freezing and drying in vacuum, but it still produced some immunity.

The masseter muscle route for challenge virus inoculation gives consistently uniform mortality results when a

sufficiently large number of animals are employed.

Attention is called to the fallacious results that may be obtained through chance when the number of animals used in a vaccine potency test is not sufficient to rule out error from this cause.

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# Sewage Disposal Problems at Army Camps<sup>\*</sup>

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THE problem of sewage disposal at army camps differs from municipal sewage disposal practice in several important particulars:

1. Army camp sewage is domestic in character, unaffected by industrial wastes. It is relatively strong and high in grease, as compared with municipal sewage. The per capita flow of sewage is generally less than in municipalities, provided reasonable disciplinary restrictions on the use of water are maintained.

2. Most of the sewage treatment plants at army camps are for temporary use only; that is to say, they are predicated on the assumption that the camps will be in active existence for a period of 5 years. This has a bearing on the economic balance, as between installation costs and operating costs, and implies simple and temporary construction to the extent possible.

3. Speed is an essential factor in the design and construction of sewage disposal works for army camps, whereas municipal installations are seldom of an emergency character and generally can be preceded by adequate preliminary investigations.

Shortly after the program for the construction of army camps was started, it became apparent that the various architect-engineers selected to design and supervise construction of such camps had widely divergent ideas regarding what was necessary for the disposal of sewage. It also became apparent that there was considerable divergence in point of view among the state departments of health in the various states in

which cantonments were being built. To harmonize these divergent ideas, two firms of engineers, Metcalf and Eddy of Boston, and Greeley and Hansen of Chicago, were employed, to act jointly, in reviewing policy with reference to sewage disposal and for the purpose of indicating in general terms the degree of treatment required at each camp. These engineers prepared a report for the office of the Quartermaster General, Construction Division, Engineering Branch. In this report were embodied: (1) a review of the special problems involved in disposal of sewage from army camps; (2) best available estimates of sewage quantities and sewage characteristics, and (3) recommendations for loadings for various sewage treatment devices likely to be used at army camps.

In developing this report, the engineers kept constantly in mind: (1) security to the public health, (2) sufficient treatment of sewage to prevent serious nuisance, (3) economy, and (4) speed of design and construction.

There are several general types of camps as affecting the design of sewage disposal plants; namely, (1) those built in conjunction with permanent army posts, (2) those built in new locations.

Sewage treatment plants for permanent posts are built on a permanent basis, as for municipalities, while those for temporary camps and cantonments are built as simply and cheaply as practicable. A special case arises where temporary camps and cantonments are

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<sup>\*</sup> Read before the New Jersey Section of the American Water Works Association at the Seventieth Annual Meeting of the American Public Health Association in Atlantic City, N. J., October 16, 1941.

built in conjunction with permanent posts, as at Fort Knox and Fort Riley. Where practicable, separate installations are desirable for the temporary camps and the permanent posts, as was done at Fort Riley. In some cases this is not practicable. If the permanent establishment is large as compared with the temporary one, a single plant for both may be justifiable. This is the case at Fort Knox. A single plant was established for the entire post utilizing as much of an existing treatment plant as practicable. Division of treatment devices into a suitable number of units will permit latitude in meeting wide variations in sewage flow represented by the entire post and by the permanent post alone. Where the natural outlet for all sewage is in one place and where the temporary establishment is relatively large it may be desirable to build sewage treatment works in two sections—one on a basis for economical permanent operation and the other on a basis for economical temporary operation.

Sizes of the camps, as measured by the number of troops vary from 1,500 to 60,000. The majority, however, range between 12,000 and 36,000 troops.

After a review of all of the available data on sewage quantities obtained during the war of 1917 and 1918, which data incidentally, are meager, the consulting engineers estimated a water consumption of 100 g.c.d. (gallons per capita daily) and a sewage flow of 70 g.c.d. It was realized, of course, that with uncontrolled use and waste of water both the water and the sewage quantities might be greatly increased but it was assumed that sufficient disciplinary control would be exercised to keep the water consumption and sewage flow quantities within these figures without sacrifice of convenience and cleanliness.

Because of the daily military routine which causes most of the population to be doing the same things at the same

time, there are rather violent fluctuations in sewage flow. To provide for this it was assumed that the flow for 3 or 4 hours might average double the average daily flow or at the rate of 140 g.c.d. It was further assumed that peak flows passing through treatment works would be at three times the average rate of 210 g.c.d.

As to the characteristics of the sewage, the meager records of the war of 1917 and 1918 gave little help. Such records as could be found suggested the following characteristics:

	<i>Parts per Million</i>	<i>Pounds per Capita per 24 Hours</i>
Suspended solids	460	0.27
B.O.D. (5 days)	290	0.17
Ether-soluble matter	150	0.09

#### SECURITY TO PUBLIC HEALTH

As indicated, the first consideration in connection with disposal of sewage at army camps is security to public health. On this point there can be no compromise.

Public health is initially protected in all of the camps by the use of sanitary sewers only. Surface drainage is removed in ditches, through culverts and occasionally in relatively short covered drains. Thus there is no mixed sewage and storm overflow whenever there is rainfall, and therefore all sewage carrying infectious material may be passed through treatment works. While treatment works have by-passes, these are not used except during unusual emergencies. Duplicate units will always permit some treatment both primary and secondary. Even when by-passing, the sewage may be heavily chlorinated.

Public health may be affected by any one or all of the following uses of the receiving body of water: (1) for public water supplies, (2) for bathing and boating, (3) for maneuvers including fording, crossing in small or improvised boats, bridge building, etc., (4) for shellfish layings, or (5) for watering of dairy cattle.

*Protection of Public Water Supplies—*

There are no instances where it was impossible to find an outlet for sewage reasonably remote from water works intakes. In some instances, there are downstream intakes so far away that self purification is adequate to avoid undue burden on water purification works. An additional factor of safety is afforded by chlorination of the final effluent, which is required in all cases for other reasons than the protection of water supplies.

*Bathing and Boating—*In but few cases was it necessary to discharge sewage from army camps in close proximity to places normally used by the public for bathing and boating. Where such recreational uses exist, chlorination of the final effluent is adequate to protect public health. In a few instances, a relatively high degree of B.O.D. reduction and clarification was sought to avoid any unsightliness.

*Maneuvers—*A number of streams into which sewage effluents are discharged are within maneuver areas. In ordinary fording in mechanized equipment, in horse drawn vehicles, or on horseback, there is little danger of acquiring a communicable disease. Even fording by foot soldiers, if necessary, is not a serious danger. Perhaps the greatest danger is when men fall into the stream, especially a deep one. All reasonable requirements for maneuvers may be met by an effluent that does not look bad, that does not smell bad, and which is also adequately chlorinated.

*Protection of Shellfish—*Along the coastal regions, sewage may pollute commercial shellfish layings. Any effluent that will prevent objectionable odors or unsightly conditions may be made harmless to shellfish layings by adequate chlorination. Because of the use of sanitary sewers, army camps are less of a hazard to shellfish than is sewage from a municipality having combined

sewers, even though the municipality has sewage treatment works.

## PREVENTION OF SERIOUS NUISANCE

The degree of treatment necessary to prevent serious nuisance may be and was subject to rather wide divergence of opinion. The word "serious" implies the permissibility of some nuisance. Generally speaking, it was assumed that some discoloration, some turbidity, and an occasional slight odor would not be serious. Cases varied, however. In some situations the effluent outfall was just above a much traveled bridge, a cluster of dwellings, or otherwise frequented places. In these situations, more thought was given to the suppression of odors and any visible evidence suggestive of sewage than would seem necessary where the receiving stream is remote from habitations and frequented areas.

Application of chlorine to the final effluent provides considerable latitude of control over nuisance, as well as being a safeguard to public health. Suitable chlorination of an effluent will retard putrefactive decomposition until the sewage effluent passes critical points, such as a much used bridge above mentioned. Decomposition may in some cases be retarded by chlorination, so that reaeration and dilution may take place more rapidly than the absorption of oxygen. Thus, a condition of non-odorous aerobic decomposition is maintained.

While the consulting engineers recognized that cases might occur which called for a high degree of treatment, stress was placed upon the minimum initial expenditure that would give acceptable results.

## DEVICES AND LOADINGS

As a result of the considerations outlined, the consulting engineers recommended that when the minimum average monthly flow in the receiving body of water is 4 cu. ft. or more per second

per 1,000 population contributing sewage in the general locality of the camp, screening, sedimentation, and chlorination will suffice. For flows less than this in the receiving body of water, the consulting engineers recommended biological treatment embodying standard rate trickling filters, high rate trickling filters, or activated sludge, as required by local conditions. High rate trickling filters on account of lower costs with final chlorination were regarded as adequate, even where dilution is very small, or at times reduced to zero, unless there exist local conditions of a special nature demanding a higher degree of treatment.

A typical sewage treatment plant might include the following elements:

Bar screens—hand cleaned

Measuring devices, with simple automatic recording instrument, such as a weir, Parshall flume, Palmer-Bowlus flume, but not a Venturi meter

Preliminary sedimentation tanks

Biological treatment, using high rate trickling filters with recirculation of effluent

Final sedimentation tanks

Chlorination equipment, with contact time in final sedimentation tanks, in separate contact tanks, in a lagoon or in an outfall sewer

Sludge disposal structures, comprising digestion tanks (generally heated), sludge pumping station, and sludge drying beds or sludge lagoons

With minimum dilution during a driest month of 4 cu. ft. or more per second per 1,000 population, the biological treatment and final sedimentation tanks would be omitted.

Loadings on the several devices were recommended, as follows:

*Primary Sedimentation Tanks*—Three hours displacement on basis of average flow. With effluent from high rate filters recirculated to the inlet of the primary sedimentation tanks, the volume of the tanks would be correspondingly increased. Where activated sludge is justified, the displacement period in the primary sedimentation tanks may be reduced to  $1\frac{1}{2}$  hours.

*Trickling Filters*—For high rate trickling filters not over 3,000 lb. of B.O.D. per acre-foot per day, or a population load of 35,000 per acre-foot. This is applicable to southern camps. For northern camps, a more conservative population loading of not over 30,000 per acre-foot was recommended.

For standard rate trickling filters, where justified, a maximum population loading of 5,000 per acre-foot for southern camps and 4,000 per acre-foot for northern camps was recommended.

*Final Sedimentation Tanks*—A flow not to exceed 800 gal. per sq. ft. per 24 hours, based on average flow, and not less than  $2\frac{1}{4}$  hours displacement period. With recirculation of effluent of final tanks to influent of high rate filters, the capacity would be correspondingly enlarged.

*Sludge Digestion Tanks*—Two to 3 cu. ft. per capita with heated tanks. For unheated tanks, add 25 per cent to 50 per cent to the capacity, using the larger figure for locations close to buildings. For plants using activated sludge, increase these figures by 50 per cent.

*Sludge Drying*—For standard sand drainage beds, use 0.5 to 1 sq. ft. per capita for dry southerly climates, and 1.0 to 1.5 sq. ft. per capita for humid northerly climates. In warm dry climates in favorable locations, lagoons may be used with areas of 2 to 3 sq. ft. per capita.

#### ATTITUDE OF STATE DEPARTMENTS OF HEALTH

Some engineers of state departments of health appear to regard this policy and the plant loadings outlined as too lenient. They feel that, having labored to educate the public to demand clean streams, adoption of lower standards of treatment on the part of the United States Government at army camps will undo much of the good work that has been accomplished after years of educational effort in their respective states.

They believe that the federal government should not act to tear down standards, but should act to build them up; and that the most complete methods of sewage treatment, practicable of application, are none too effective at best and should be used when dilution is small.

The opposing attitude is that cantonments, being of a temporary character, do not warrant elaborate treatment, and that any treatment which does not cause serious nuisance and which protects the public health is sufficient. It is also argued that the country is at war when not a dollar should be spent for superfluities.

#### ECONOMY

Broadly speaknig, it is better to incur large operating costs for temporary camps, than to spend large sums of money on initial installation. The liberal use of final chlorination, while somewhat costly in operation, makes it possible to get along with less biological treatment than might be required for permanent installations in municipalities. Not only may chlorine be used to retard decomposition, but it may be added in amounts that may result in some direct oxidation, where and when necessary.

The question of economy has already been touched on incidentally in discussing other objectives of sewage disposal from army camps. Three factors relating to economy may be stressed:

1. A desire to expend the least total money necessary during the existence of the camps to protect the public health and otherwise obtain acceptable sewage disposal.
2. Recognition of the fact that relatively high operating costs may be incurred for the short period during which the camps may be used, as a means of keeping down total costs.
3. Recognition of the fact that sewage disposal contributes but little to a successful defense effort.

With these criteria in view, the consulting engineers leaned toward rela-

tively high loadings of sewage treatment devices, the use of high rate trickling filters, with recirculation of the effluent, where secondary treatment is needed, and the elimination of final or polishing treatments. It sometimes happens, as in at least one instance in New England, where a high degree of treatment on intermittent sand filters proved to be the economical treatment, because the sand was already in place and required but little labor to put it in condition to receive sewage.

#### SPEED IN DESIGN AND CONSTRUCTION

An important factor in connection with army camps is speed in design and construction. It was deemed important to have sewage treatment works in readiness to function as soon as troops arrived. Design was directed toward simplification of construction and the reduction of quantities of materials to a minimum. To this end, any devices requiring complicated reinforced concrete were discouraged. For example, sedimentation tanks with mechanical removal of sludge were preferred to Imhoff tanks, even for relatively small installations, because of the more or less complicated concrete work and deep excavation inherent in Imhoff tank construction. Mechanically operated and cleaned screens were discouraged, because of their cost and the rather intricate concrete required for their installation. Trickling filters were preferred to the activated sludge process, because of relative simplicity. High rate trickling filters were preferred over standard rate trickling filters, because lesser quantities of filtering and other materials were required. Buildings were made of wood of simple design, except where there was a serious fire hazard. In such cases, the buildings were made of brick. Limited laboratory facilities were provided, and where water supplies needed laboratory control, an effort was made to combine water and sewage laboratories.



Operation of sewage treatment works at army cantonments has not been all that could be desired. No definite provision was made for operation until many of the cantonments were complete. Often the architect-engineers on the job had to make strong representations to obtain competent operators.

The general procedure was to assign the operation of both water works and sewage treatment plants to the Post Detachment. More often than not, the Post Detachment had no one qualified to deal with these problems. In some instances, chemists were certified from civil service lists. Some of these men did good work, but some had little experience or support. Suggestions were made that the operating personnel be taken from civil life, with the expectation that a suitable number of qualified operators might be recruited from existing large sewage treatment plants and water purification works about the country. This suggestion did not progress very far, and in most instances, the architect-engineers were obliged to give a substantial amount of attention to operation of sewage treatment plants and the training of the personnel. Sometimes, the architect-engineers were able to secure the employment of experienced operators.

Recognizing the necessity of a more effective handling of the various special engineering problems in connection with army camps, there was established in the office of the Constructing Quartermaster General at Washington a staff of civilian engineers, headed by F. H. Fowler, comprising recognized experts in various fields, including sewerage. It

is the duty of this group to advise regarding a well coördinated policy and control of both installation and operation of various utilities and structures at army establishments. In the matter of design and construction, the arrangement has been effective, but in the matter of supervision of operation, suitable lines or channels of information and control apparently have not yet been developed, though effective efforts are now being made in this direction. It is difficult, for example, to obtain prompt and reliable information at headquarters in Washington as to performance of the various sewage treatment works, and it seems to be equally difficult for the headquarters in Washington to obtain prompt rectification of any defects, either in design or operation, that may come to the attention of headquarters.

Army personnel at camps is likely to be changing more or less constantly, bringing to bear an upsetting effect on the continuity of management of camp utilities. As operation and management of utilities are essentially civilian activities, and as continuity of control is essential, regardless of the changes in troop personnel, it would seem desirable to man all water and sewage treatment works with qualified, experienced, civilian operators, and this principle has apparently been recognized. The efforts of these operators should be fully coördinated, by a central agency in Washington, using lines of contact which cut across usual military channels and in particular, records should be kept, reviewed and summarized for present control and for future use in design by experienced engineers.

# Willingness of Individuals to Be Examined for Tuberculosis\*

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DURING the period January, 1937–May, 1938, the tuberculosis case finding activities of the Department of Health, Detroit, included the canvassing of about 196,000 persons in the low income group. The canvassing was done by the nurses of the Department of Health with the object of getting as many persons as possible examined for tuberculosis. The economic status of the population canvassed was such that very few were in a position to pay for the examination urged by the nurse. The examinations, however, could be had without expense to the individual, provided the physician making the

examination made an official report of his findings, this report being a requirement for payment by the city for his services. This arrangement made it possible to check the reports of examinations against the list of persons visited by the nurses, and thus to determine among other items the degree of response.

Of the total number visited, the information as to age and color was complete for 187,543; and of this number 48,179, or 25.7 per cent, responded.

For the purposes of this study, all persons having a satisfactory x-ray examination of the chest, and all persons having a negative tuberculin test without an x-ray examination of the chest, were included in the group considered to have responded, and to have been examined. Persons to the number of 3,269 having a positive tuberculin

TABLE 1

*Degree of Response—White Population*

Age	Total Visited	Total Responding	Per cent Responding
0- 4	9,024	1,655	18.3
5- 9	10,353	2,854	27.6
10-14	11,818	3,365	28.5
15-19	13,099	2,517	19.2
20-24	13,354	2,069	15.5
25-29	10,053	1,414	14.1
30-34	7,936	1,068	13.5
35-39	7,503	976	13.0
40-44	8,837	1,199	13.6
45-49	7,621	994	13.0
50-54	6,238	688	11.0
55-59	3,387	333	9.8
60-64	2,446	155	6.3
65-over	3,302	148	4.5
Total	114,971	19,435	16.9

TABLE 2

*Degree of Response—Colored Population*

Age	Total Visited	Total Responding	Per cent Responding
0- 4	6,747	2,977	44.1
5- 9	6,974	4,128	59.2
10-14	6,832	3,863	56.5
15-19	5,605	2,044	36.5
20-24	6,221	2,115	34.0
25-29	6,916	2,372	34.3
30-34	7,661	2,743	35.8
35-39	8,639	2,947	34.1
40-44	6,299	2,122	33.7
45-49	4,088	1,344	32.9
50-54	2,688	873	32.5
55-59	1,475	475	32.1
60-64	945	318	33.7
65-over	1,482	425	28.7
Total	72,572	28,744	39.6

\* Read before the Vital Statistics Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 15, 1941.

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TABLE 3  
Case Rates by Age and Type of Case

Age	Total Examined	Active Cases Found		Cases per 1,000 Total Examined	
		Primary	Adult Types	Adult Types	All Types
0-4	4,632	4	1	0.22	1.03
5-9	6,982	11	4	0.57	2.29
10-14	7,228	6	12	1.66	2.49
15-24	8,745	2	39	4.46	4.69
25-44	14,841	1	63	4.24	4.31
45-over	5,751	..	27	4.69	4.69
Total	48,179	24	146	3.03	3.53

test without an x-ray examination of the chest were excluded on the ground that such persons had not been adequately examined.

The effect of age on the degree of response is set forth in Tables 1 and 2. For both the white and colored populations, the best response was obtained for the age group 5-14 years. Beyond this age group the percentage of response for both populations declined with increasing age. For both populations the response for the age group 0-4 years was less than among the older children. It should be noted that for every age group the percentage of response is roughly twice as great, or more, among the colored as among the white population.

Another question suggests itself, namely, are the age groups in which the response is greatest the age groups in which the case rates for tuberculosis are the greatest? Table 3 presents the information concerning the cases found by age and the number examined for both populations combined. If adult types of tuberculosis only be considered, the age groups of greatest response

were not the ones in which the tuberculosis case rates were the highest. Even if the primary active type is included, and this type occurs in the main in children, the age of greatest response was still not the age in which the greatest relative number of cases were found. Furthermore, the application of the chi-square test to the data of Table 3 for the latter situation, which minimizes the difference in cases found as between the younger and older age groups, indicates that the difference observed between the proportion of cases found in these two groups is significant.

#### SUMMARY

Two populations, white and colored, have been studied in regard to their response to the suggestion that the individuals included be examined for tuberculosis, with the following results:

1. The response was greatest in the younger age groups, especially the 5 to 9 and 10 to 14 groups.
2. The colored population responded more than twice as well as the white.
3. The age of greatest response was not the age of the highest tuberculosis case rates.

# Development of Training Courses for Food Handlers in Texas\*

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MOST public health workers realize after a few years' experience that basic ordinances play only a minor part in any effort to improve the facilities with and environment under which foods are handled, that it is next to impossible to have an effective supervisory service without intelligent coöperation by the industry and that the success of such a coöperative program depends largely upon the education of the proprietors of food handling establishments and their employees. Having observed the attempts to teach sanitation to the food handling industry by means of individual conferences and demonstrations during routine inspections, the author decided that there must be a more effective way through which this most important function could be exercised.

This problem seemed to present itself in this manner: (A) Who are we planning to train? (B) What are their problems and viewpoint? (C) What do they need to know? and (D) How are we to get this information to them? The answer to the first of these queries is "The owners and operators of food handling establishments and their employees." In answer to "B," suffice it to say that there are many problems in an undertaking of this kind. Training adults who may or may not be recep-

tive calls for attention to factors not present in child training. They are out of practice in the art of learning. Often, too, adults do not have an incentive to learn, and this incentive must be created. Many have but little time to attend classes or meetings. Hence, the frequency and time, as well as length of meetings should be fitted to each group. If regular attendance is expected, the process of learning should be made pleasant. The proper arrangement of seats, sufficient light without glare, ease of seeing and hearing and proper room temperature should all be kept in mind. Learning should be made easy and simple, and complicated problems and formulas should be avoided. Adults may be self conscious about learning new things and are easily scared. This pitfall must be avoided, too. Also, they have opinions and ideas of their own and these should be carefully respected by the teacher.

A brief answer to the item labelled "C" might be "How to handle food properly," but that would not be very helpful to one who has to learn new methods and procedures. Some knowledge of bacteriology is certainly necessary if food handling personnel are to understand the "why" of sanitary procedures. Communicable disease control and the causes of fermentation and decay should follow information on elementary bacteriology. With the discussion of communicable diseases, decay, and fermentation, some exposition of the vehicles, methods and modes of disease

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\* Read at a Joint Session of the Conference of State Sanitary Engineers, Conference of Municipal Public Health Engineers, and the Engineering Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 14, 1941.

transmission should be given. Therefore, some medical zoölogy or at least pertinent data concerning flies, rats, and roaches would be needed to complete the preliminaries and give the food handlers the background necessary to understand the reasons for sanitary rules and regulations. Of great interest to the employer and owner is the loss and wastage of food, and certainly the increasing amount of food poisoning and food infection is of interest to the public health worker. Therefore, the next topic for discussion might very logically be foods.

Disinfection, sterilization or sanitization of utensils is probably one of our greatest problems and should certainly be included in any training course. Another factor in the spread of disease may be the individual food handler himself. Therefore, with some time devoted to personal hygiene and sanitation, we have a program as follows:

1. Bacteriology
2. Communicable diseases
3. Medical zoölogy
4. Foods
5. Disinfection and sterilization
6. Personal hygiene and sanitation

Realizing that a training program would have to be short and even though progress was expected to be made only very slowly, it was decided to limit the first unit to 12 hours.

The last problem is how to teach so that the class might benefit. We decided to use as many teaching aids as possible, hoping that if our information failed to reach the "students" in one form, it would be retained if presented in another. The kind of lantern slides, movies, and lesson material to be used was therefore carefully planned. Experience in other adult classes had shown that two meetings a week was satisfactory to most people, and that 1½ to 2 hours was about as long as the average group would remain attentive. Hence these time limits were accepted. Follow-

ing these preparations, the first school was held in 1938.

First, an easily accessible central meeting place was selected. Classes were held in the afternoon and at night and on alternate days in order to make the work course available to those working day or night. Personal calls were made by the local sanitarians to each food handling place, explaining the course and leaving a program for the school. Several announcements and news articles appeared in the local paper. Every effort was made to get as many food handlers as possible interested. Approximately 800 were finally enrolled and 437 of these received certificates. This first school was held in coöperation with the State Board of Vocational Education and certificates of attendance were issued to those attending 80 per cent of the meetings.

As the success of this first effort became known, health unit directors and engineers began to request that similar schools be held in their cities. As these requests continued to come in, it became evident that additional instructors would be needed. Hence, other itinerant instructors were trained to handle the teaching program. It became evident that even with three itinerant instructors, only a few thousand of the many thousands of food handlers in the state would have an opportunity to attend these courses within a reasonable length of time.

To check the value of this work, surveys were made. These, with letters and statements from employers and executives, convinced us that the course was effective. Officials of state associations of restaurateurs, cooks and waiters had also become interested by this time and were giving their fullest co-operation. Probably the most comprehensive survey of the results was found in the report of the sanitary engineer of a city of approximately 75,000. This showed that in a survey of that city's

food establishments made 4 months after food handlers schools had been held, 91 per cent of the food establishments were complying with city regulations concerning proper equipment for sterilization; also, that proper methods of procedure were being practised in 84 per cent of the drug stores, restaurants and bars as compared with the 15 per cent compliance found in a similar survey conducted prior to the holding of the schools.

In order to intensify the training effort, full-time programs were next inaugurated in the larger cities. This involved the training and employment of a full-time instructor and the starting of a continuous training program for the food handling personnel of the first of these cities, namely, San Antonio. Here it was possible to conduct four series of classes each month, giving training to 175 to 200 students per month. In co-operation with the local director of vocational education, the State Department of Vocational Education, and the City Health Department, a full-time instructor was hired; equipment and mimeograph materials were purchased; and other necessary arrangements completed. When a new program is started, a demonstration course is held for owners and managers only, in order that they may be familiarized with the training that is being made available to their personnel. Following this course, the regular program is inaugurated. Fort Worth was the second city to accept this plan of training.

Even with our itinerant instructors and the full-time teachers in the larger cities, we soon realized that, due to the size of the state, it would be possible only to reach the smaller towns once every 3 to 5 years. Therefore, the next move in broadening the program was to train one sanitarian in each county health unit and to make available to him slides, movies, mimeographed and other material necessary to conduct a

successful course. This move is going forward, and many sanitarians are holding their own schools every 3 to 6 months. Therefore, to date, our program has grown from one school a month operated by an itinerant instructor to many schools each month held either by itinerant instructors, full-time instructors, or unit sanitarians.

Regardless of where the course is held or who conducts it, there are usually two meetings each week for a period of 3 weeks; each class period is from 1½ to 2 hours long; the lessons are taken up in the same sequence, and the same slides, movies, demonstration material and tests are used. However, the individuality of the instructor and the local problems are not overlooked. There is nothing mandatory about the methods of instruction, but it has been found that most satisfactory results will accrue to a program which follows the worked-out plans most closely.

As previously mentioned, all the fundamental methods of teaching are employed. Time is given to lectures which are supplemented by discussion. Printed information is handed out at each meeting and this must be studied if subsequent quizzes are to be successfully passed. Usually all the printed material is combined into a small manual by the student at the end of the course. This, then, is taken up by the instructor at the close of the course to see that all materials are in place and then returned to the student to be kept and used later as a reference. True and false and multiple choice tests are given at five of the six meetings of the course and eight movies are used. Some of these have a commercial aspect and others have been prepared in our own visual education laboratories. A series of 125 stereopticon slides 2" x 2" in size, have been prepared, making it possible for the instructor to use about 20 slides at each class. These are changed frequently and kept up-to-date or

changed to meet particular local problems. Demonstrations are particularly illustrative. For example, one Petri dish containing nutrient agar is passed among the students at the first class meeting in order that they may see and examine it. Then three students volunteer as follows: one lightly touches the agar in a sterile Petri dish with three fingers; one takes a hair from his head and drops it on the agar of a second similar plate; and one coughs into the third dish. These 4 dishes are then put into an incubator at the close of the class. At the beginning of the second class, which is 48 hours later, the dishes are passed among the students for them to note the bacterial growths. Similar demonstrations are made wherever practical in order to impress the students with the reasons for and the necessity of sanitary practices.

Certificates of completion are issued to those attending 80 per cent of the meetings in a course. In the larger cities where courses are being conducted continually and missed classes may be made up, it is necessary to attend 100

per cent of the class meetings. Some cities are issuing wall placards suitable for framing to establishments where employees have all secured school attendance certificates. This not only merits public approval but encourages the proprietor to keep his personnel trained in order to retain the placard.

In the larger cities where full-time instructors are employed in coöperation with the State Board of Vocational Education, an enrollment fee of 50 cents is charged. This fee is paid in advance by the employer or, if by the employee, it is refunded to him upon presentation of his attendance certificate after completing the course. The money thus collected is used to pay for mimeographed materials, movies, projectors, and other items needed to conduct the course.

We do not feel that there is anything unusual or exceptional about this training program. We have found that if the fundamental, practical knowledge is disseminated in a simple and attractive way, the average food handler will take advantage of every opportunity to learn more about his or her job.

# New Light on the Relation of Housing to Health<sup>\*</sup>

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NO final word is going to be said today, or for a long time, on the precise effects of housing on health, any more than any final word can be said on other very broad problems, such, for instance, as the relative importance of heredity and environment. Even if we were able to establish precise limits to what we mean by housing and to what we mean by health—on which there can hardly be complete agreement—the interrelation of socio-economic facts with housing, on the one hand, and with health, on the other, would make impossible any clear-cut determination of the effects of housing *per se* on health.

Bad housing is a symptom of low economic status; poor health, to a degree, is another symptom. And, to make matters more confusing, any element of bad housing which we choose to employ as a basis for comparisons stands not by itself, but is an index of bad housing in general. Thus, when I show, as I shall, higher rates for pneumonia or tuberculosis in crowded than in uncrowded households, it is not going to be possible to say that the crowding itself has produced all the excess. Perhaps the excess is primarily due to some other element in bad housing; perhaps it is in part a reflection of inadequate food, or insufficient medical care, or

other deficiencies due to lack of money; perhaps, indeed, in many instances illness has lowered the income of the family so that it is not possible to ascribe the excess to economic factors at all. However, there is a good deal that we can tell the public now about healthful housing.

Good housing is important. It is, I believe, the right of all persons. It would be their right whether or not their health were seriously affected. It is doubly their right since their health *is* seriously affected. For, just because we are not able to evaluate the precise influence of the various elements of bad housing on the occurrence of disease, we are not entitled to come to the negative position that there is no influence. In fact, if under a definition of housing, we choose to include crowding, proper sanitation, playground space, and home environment in general, and if at the same time we choose to include under health the maintenance of a state of physical, mental, and social efficiency, the causative relation becomes quite obvious.

Many examples could be cited to bring out this point, or reference made to such standards as the "Basic Principles of Healthful Housing" of the Committee on the Hygiene of Housing of this Association<sup>1</sup>—which in themselves constitute new light on the relation of housing to health. It is my purpose, however, not to list examples, but to present some statistical data, which, although suffering from the limi-

<sup>\*</sup> Read at a Joint Session of the Health Education Section and Committee on the Hygiene of Housing of the American Public Health Association, at the Seventieth Annual Meeting in Atlantic City, N. J., October 16, 1941.



tations just discussed, are still striking enough and new enough to be of interest to you. They are taken from data collected in the National Health Survey, a house-to-house canvass of illness and medical care in relation to economic and social factors, made by the U. S. Public Health Service in 1935-1936 in coöperation with the Work Projects Administration. Information was obtained from a responsible member of the household. The analysis covered  $2\frac{1}{2}$  million persons in 83 cities scattered over 18 states. In large cities a random sample of the population was obtained; in smaller cities the total population was covered. I shall not discuss the survey technics further, since they have been adequately described in reports already published. Also I shall not attempt even to summarize all of the Health Survey data collected on housing, which include the extent of poor housing in urban areas and its relation to economic status, color, and other factors.<sup>2</sup> For the present purpose it must suffice to show a few charts of outstanding findings bearing particularly on the relation of housing to health.

First, let us consider the association of the common communicable diseases of childhood with crowding. Crowding is expressed for this purpose as persons per habitable room, and was calculated separately for each household. The groups used are (a) households with one person or less per room, (b) households with more than one person and not more than one and one-half, and (c) households with more than one and one-half. The percentages of households falling into these three groups were, respectively, 75, 17, and 8. A more severe degree of crowding could have been selected, but the percentage of households in the group would have been less.

It may be stated that some of these diseases, particularly diphtheria and mumps, show very much higher rates in crowded households than in uncrowded

ones; but to save time I have concentrated on perhaps the most striking fact with respect to this category of diseases, namely, the tendency for them to occur at an earlier age in such households.

Hence in the chart (Figure 1) are shown, not the actual rates, but the ratios of the rate in the age group under 5 to that in the age group 5 to 9. Where this ratio is relatively high, it indicates an earlier age incidence. Obviously the ratio will, apart from questions of crowding, tend to be much higher for some diseases than for others (whooping-cough as against mumps, for instance). The bars have therefore been placed on a relative basis, those for the group with one person or less per room being made equal (as shown by the dotted line).

What is seen in the chart is that the crowded households have a longer bar for each of the seven diseases, clearly demonstrating that the cases occur relatively earlier in the crowded households for every one of the diseases listed. The earlier occurrence of these communicable diseases in crowded households is of significance because of the higher rate of fatality at the early ages.

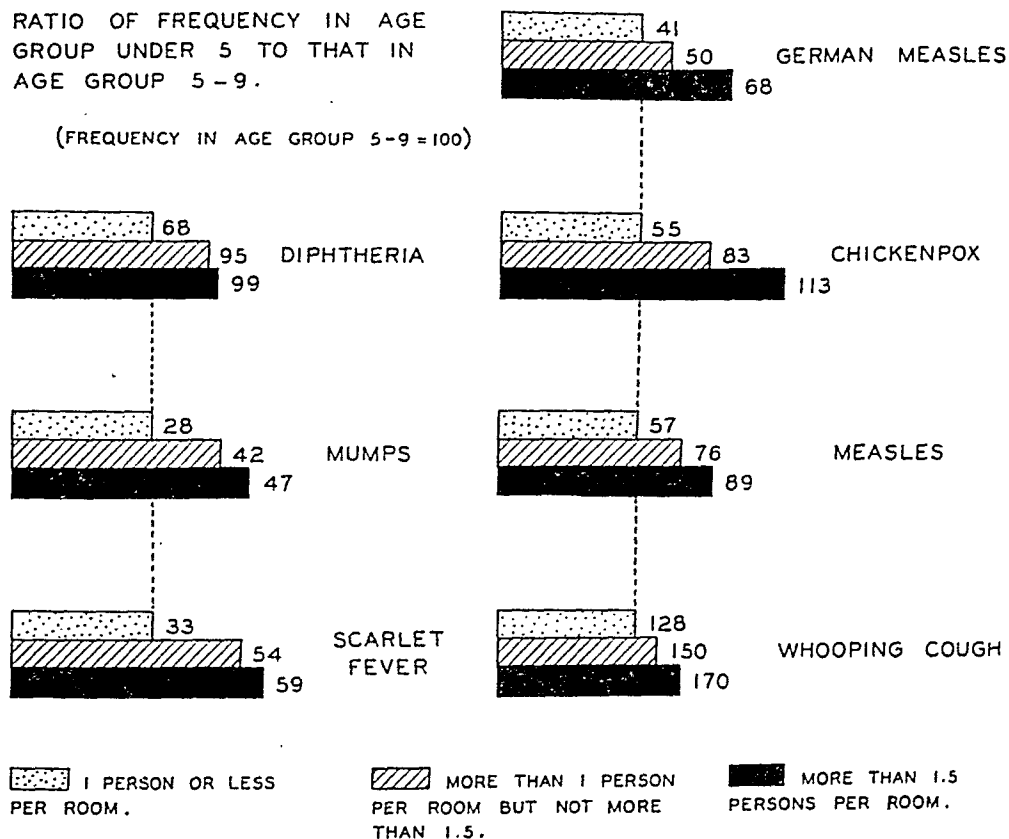
Comparisons of health survey illness rates against degree of crowding have been made for a number of diseases in addition to those shown in this chart, family income being included in the comparisons. To obtain sharply distinguished groups as to over-all housing conditions, we might contrast (a) the low income (relief) group with more than one and one-half persons per room, and (b) the all income group with one person or less per room. On this basis there is an excess for all causes of illnesses disabling for a week or more of nearly 75 per cent; for tuberculosis (under 65 years of age) of 350 per cent; for pneumonia, of 150 per cent; for rheumatism (adults) of more than 100 per cent; and for influenza of 35 per cent.<sup>2</sup> Clearly, in the light of my introductory comments, all of this excess

FIGURE 1

## COMMON COMMUNICABLE DISEASES OF CHILDHOOD

RATIO OF FREQUENCY IN AGE GROUP UNDER 5 TO THAT IN AGE GROUP 5-9.

(FREQUENCY IN AGE GROUP 5-9 = 100)



NATIONAL HEALTH SURVEY, 1935-36

cannot be regarded as due to crowding. In the published reports the data are shown by income, with the necessary explanations; but I suspect we lean over backward when we attempt to make housing comparisons within the same income groups, since, at low income levels, homes which do not show crowding may still be substandard.

For one disease—tuberculosis—an attempt has been made to deal with the so-called “secondary” attack rate in relation to crowding, since the effect of bad housing might be expected to be reflected most clearly in the occurrence of “secondary” cases into households into which cases had already been introduced. Households in which a “pri-

mary” case of tuberculosis was reported as first noticed within 24 months of the day of the visit have been considered. All persons in these households, except those with the “primary” case, have been regarded as contacts, and only persons related to the head of the household are included.

The “secondary” attack rate (expressed in terms of the number of “secondary” cases per 1,000 years of observation) was 43 for the relief group with more than one and one-half persons per room; and 14 for the all income group with one person or less per room—an excess of 200 per cent. In Figure 2, these “secondary” attack rates are exhibited. The rates for the group with

one person or less per room have been assigned bars of the same length to facilitate the relative comparison. In the top section, we have attempted to eliminate the factor of income by adjustment to a standard income distribution. As indicated previously, in doing so we have probably leaned over backward. Hence, this is a conservative statement. For the total group under 65 years of age, the excess in the "secondary" attack rate in the crowded households (with the effect of income eliminated, as described) is not great—under 20 per cent. However, for children it is 80 per cent. You will observe that a series of bars is shown separately for the relief group. The excess is quite marked, both for all ages under 65 and for children.

Although I am attempting to cover a good deal of ground in a short discussion, I cannot help but pause to refer to the continuing significance of tuberculosis. Sometimes we lull ourselves with the thought that it has declined from

first cause of death to sixth, without realizing that it remains today the most important disease cause of death among young adults, and a vast problem from the point of view of cost of treatment as well. In this connection the close association with housing which we have just illustrated is significant.

At this point let us leave the index of crowding and consider the incidence of digestive diseases in relation to the presence of sanitary facilities. The comparison, it is to be remarked, is still confined to urban areas. Substitution of sanitary facilities for crowding as a classifying item does not change the approach as much as one might think, since there is a marked association between the two; however, it did seem that, in the case of digestive diseases, a slightly more direct comparison was possible by the use of this index. Accordingly the households have been classified on the basis of whether they had an inside flush toilet for their exclusive use. Households with "com-

FIGURE 2

## TUBERCULOSIS

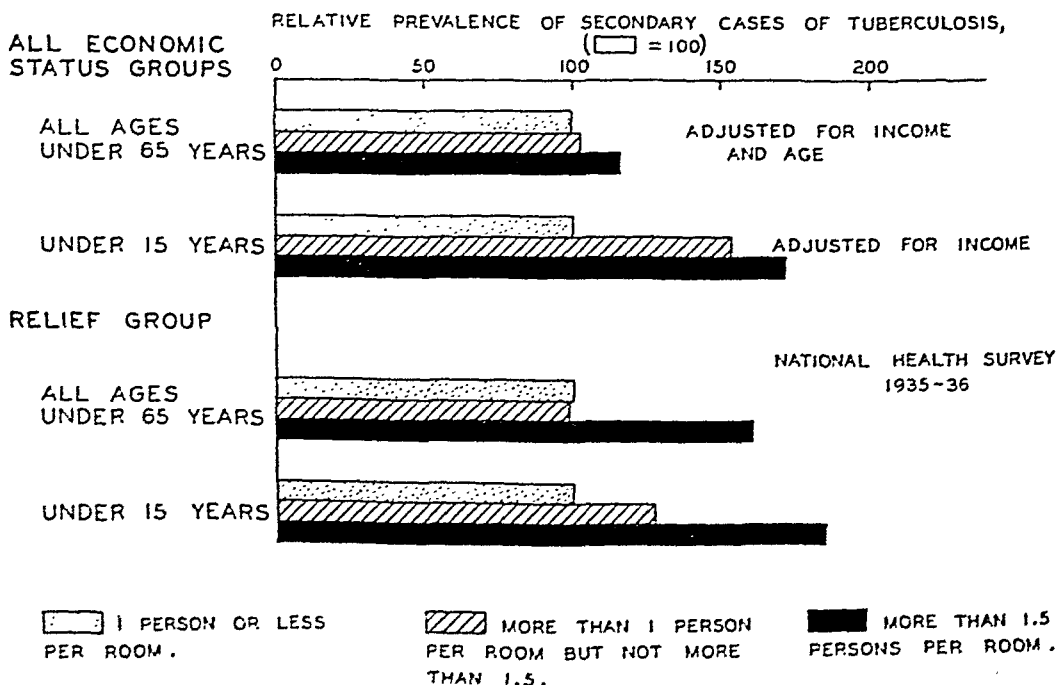
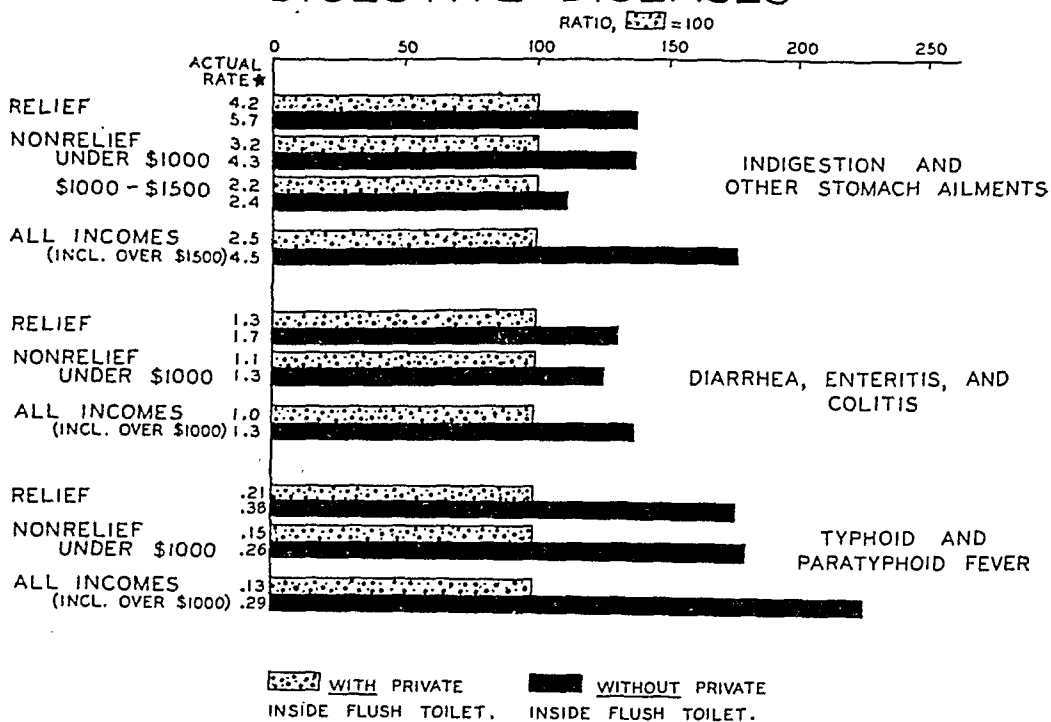


FIGURE 3

## DIGESTIVE DISEASES



★ FREQUENCY (PER 1000 PERSONS) OF CASES DISABLING 7 DAYS OR LONGER DURING 1 YEAR

NATIONAL HEALTH SURVEY, 1935-36

munal toilets" or without inside flush toilets at all formed the other group (see Figure 3).

The diseases have been classed in three categories: indigestion and similar stomach ailments; diarrhea and enteritis; typhoid fever. The rates will be the annual frequency of cases disabling for a week or longer. It will be noted that the actual rates are given in the column of figures. As in previous charts, the relative excess in poor housing has been shown by the use of ratios—here the ratio of the rate in households without private inside flush toilets to that in households with such facilities.

The greatest excess appears for typhoid fever; but both of the other groups show a significant difference. It may be stated that a further group of diseases of the digestive system, not

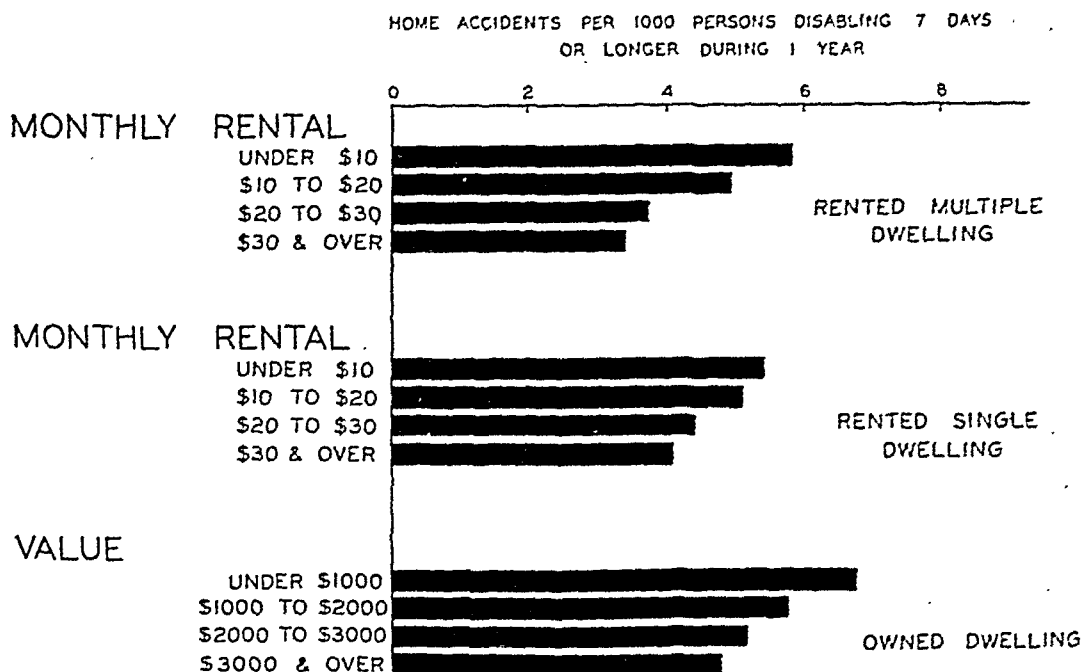
expected *a priori* to bear a relation to sanitary facilities, did not as a matter of fact show such a relation.

Although one is not able to say that all of the excess observed in this chart is due to the lack of private inside flush toilet *per se*, the data suggest that a large part of such excess may be.

Finally, as to home accidents. The illness record of the Health Survey included accidents which had caused disability for a week or more during the 12 months prior to the day of the visit, and the enumerator was required to determine for such accidents whether they occurred in the home. Some information on type of the accident (fall, burn, etc.) was also obtained. For the present discussion, I am confining attention to the frequency of such home accidents in relation to monthly rental

FIGURE 4

## HOME ACCIDENTS



NATIONAL HEALTH SURVEY, 1935-36

or (in the case of owner-occupied dwellings) estimated value. For the rented dwellings, distinction is made between multiple (i.e., apartments, flats, etc.) and single types (see Figure 4).

In each of the three groups, it is clear that as the rental or value of the house goes down, the rate of home accidents goes up. On the average it may be felt that the lower the rental or value, the more dilapidated the dwelling is likely to be, the darker the rooms, the greater the accident and fire hazard. The chart thus suggests that there is a greater accident hazard due to poor housing.

I recognize that these comparisons miss many fundamentals of the housing problem in its relation to health. We have no measures of the development of neuroses or inferiority complexes. The public health nurse will tell you of the difficulties of giving adequate care in substandard homes—equally true with

respect to medical care in general, always a serious problem in low income families. Vast sociological questions untouched in the data I have presented impinge on health. The diminished opportunities of persons living in slums mean in part diminished opportunities for positive health. Furthermore, statistics are abstract and fail to depict clearly the tragic situation with respect to individual families. But perhaps enough has been said to point the way.

Despite the impossibility of assessing the precise effect of housing conditions *per se*, it seems to me that the National Health Survey data, as briefly summarized here, have established an important broad association between housing and health. Illness rates were found to be higher in congested households, especially for certain diagnoses; digestive diseases were substantially more frequent in households not having private

inside flush toilets; serious home accidents rose with drop in rental or value. What has been demonstrated most clearly is that this excess illness rate, in whatever degree it is to be ascribed to bad housing itself, occurs in the low-income, poorly housed populations who are least able to meet the burden of disease. For it is manifest that at the heart of the housing problem lies the economic problem. A large proportion of the population of this country are not receiving incomes adequate to insure a suitable standard of living. Housing is only one symptom of this maladjustment. It must be attacked as a symptom, but not without realizing that the underlying issue is that of securing a better distribution of income and greater security against the disastrous effects of depressions. Even in this critical period, the safeguarding and furthering of sound social values are important—perhaps more important than ever—both in the extension of health programs to the entire population and in the improvement of housing conditions.

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Sickness in Relation to Its Social and Economic Setting, *Pub. Health Rep.*, 54:1663-1687, 1939) has already described the scope, method, and purpose of the National Health Survey, a project conducted by the U. S. Public Health Service during the winter of 1935-1936, in which some 2,500,000 persons in 700,000 households were covered by the house-to-house canvass method. (The National Health Survey also covered about 140,000 persons in 37,000 households in 23 rural areas.) The total urban surveyed population was so distributed as to give a sample which was, in general, representative of cities in the United States according to size and region. In large cities (100,000 population and over) the population to be canvassed was determined by a random selection of many small districts based on those used in the U. S. Census of 1930. In the smaller cities selected for study, the population was enumerated completely.

The Health Survey schedule is reproduced in the article just cited. The article also contains explanations of many of the terms employed in the present report, of which only the most pertinent will be repeated.

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3. Rates are adjusted to a standard age and size of household composition.

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## THE PROCUREMENT AND ASSIGNMENT SERVICE

AFFAIRS relating to war efforts are moving so fast and shifting so rapidly that it is difficult for one to keep up with them, and workers in public health, particularly those in the more remote places, find themselves not only confused but at a loss to know what they should do to render their best services in the national interest. Many of them have filled out questionnaires of one sort or another; some have even attempted to follow the activities of the various voluntary committees which arose in the somewhat desultory and leisurely defense period. If up to this time the average public health worker has gained a clear picture of medical preparedness efforts, he will have done more, seemingly, than those who are in the midst of things. Most of the professional organizations related to medicine and public health have carried on surveys to determine existing personnel in their respective fields and have, as it were, offered their services to the federal government. Behind these offers, of course, has been always a deep sincerity and a true patriotism, tinged perhaps sometimes with a forehanded recognition of the desirability of obtaining a place in the sun. As one would expect, this method of procedure has not brought about a hard-driving, tight organization which is capable of moving definitely, swiftly, and authoritatively. Instead there has been confusion approaching chaos. There has been lack of authority on the one hand and duplication of endeavor on the other, and inevitably there has been some maneuvering for position, with subtle and even overt demands for recognition and representation by a few of the various interests and volunteers concerned.

Apparently the federal government, finding itself with this plethora of well meaning but voluntary committees, has decided that the whole problem of recruiting and allocating personnel from the medical and related fields can be solved only by an official governmental agency. To this end, the President, on October 30, 1941, appointed a Procurement and Assignment Service for all physicians, dentists, and veterinarians of the country. This service was organized with a central board, the latter being buttressed with subsidiary committees representing medical education, hospitals, public health, women physicians, information, industrial health and medicine, dentists, veterinary medicine, and Negro health.

The board is placed under the Office of Defense Health and Welfare Services. Its basic functions are as follows: to receive from various governmental and other agencies requests for medical, dental, and veterinary personnel; to secure and maintain lists of professional personnel available, showing detailed qualifications of such personnel; and to utilize all suitable means to stimulate voluntary enrollment, having due regard for the overall public health needs of the nation, including those of governmental agencies and civilian institutions.

The organization of this board with its subsidiary committees does not mean, of course, that voluntary committees will be excluded from participation in this connection. On the contrary, their services will be utilized more than ever, but where before there was distressing dissipation and duplication of voluntary effort, the resources of these agencies will now be focused and directed by one centralized and authoritative governmental agency. The American Medical Association has set an excellent example by providing in the *Journal of the American Medical Association* a blank which any physician may utilize for enrollment with the Procurement and Assignment Service. It is understood that the dental and veterinary associations, through the inclusion of a similar blank in their respective journals, will likewise reach these professions.

One of the most serious problems that this new agency will face is that many physicians, being quite human, would rather apply directly to the Army or Navy Medical Corps for commissions than to volunteer in the Procurement and Assignment Service, which might or might not assign them in the military service and which after all is a civilian agency. In other words, they will want to go into the Army or Navy and will be loath to leave the decision to someone else. From the broad standpoint of national interest, these physicians would be wrong, but unfortunately in times of danger individuals are inclined to take dramatic and emotionally satisfying rather than logical action. Such a procedure would tend seriously to impair the board's purpose of enrolling the total medical service of the country and of allocating it in a manner which will most nearly meet the total needs of the nation in this connection. Because of this problem, the government might in the future find it necessary to follow in this instance the method planned whereby ordinary enlistments in the military and naval forces will be discontinued, with all subsequent recruitments made through Selective Service Boards. If such a step were taken then all applications for commission in the Army and Navy Medical Corps would first be referred to the Procurement and Assignment Service, and commissions would be issued only after clearance with that Service.

## THE HONORARY DOCTORATE OF PUBLIC HEALTH

IF one excludes those in the field of education, there is perhaps no professional group so nearly degree mad as are those in public health. This urge to attain better things is, of course, commendable provided the student holds the degree in proper perspective and strives for education rather than for an accumulation of credits. But even such an attitude on the part of candidates would not completely settle this matter, for in many instances the universities are themselves to blame. They, on their part, have set up such a great number of degrees in public health and have so intricately and diversely and gaudily painted these academic totem poles that one is at a loss to know whether or not sound material and good crafts-



manship went into their construction, or whether to compare one with another by length, circumference, weight, design, color, or gloss.

It is difficult to clear up this confused situation. More is involved than mere agreement between the various deans and directors of public health schools, for no small proportion of these degrees are given by universities which, properly speaking, have no public health faculties. Aside from this, the decision as to whether an institution will offer a degree of Master of Public Health or Master of Science in Public Health is not entirely within the hands of the public health faculty when there is one. Decisions of this sort, quite properly, must be made by university trustees, and, to put it mildly, university trustees as a group are not easily moved. Each such board is more concerned with having its degrees fit into its own degree pattern than with giving, in each special field, exactly the same degree as that awarded by some other university.

For these reasons we must continue, perhaps for some years, to have many kinds of Doctors of Public Health and of Engineering and of Science and of Philosophy; and Masters, and Diplomates of various sorts, in public health work. One definite contribution to clarification of this issue was, however, made when the Committee on Professional Education of the American Public Health Association and the Governing Council went on record as deprecating the practice of awarding the honorary Doctor of Public Health degree. The action of this committee was followed by a similar resolution on the part of the Association of Public Health Schools. The particular factors which influenced these bodies in adopting such a resolution are that a Doctorate of Public Health is generally recognized as the highest obtainable degree for academic work in this field; that one possessing this degree is regarded as having pursued, with unusual credit, the basic university courses required and has in addition acquired outstanding competence in some special phase of public health; and that in these circumstances the utilization of this degree as an honorary one tends to detract from the true worth of the earned degree and makes it less significant.

As things have stood in the past, an individual endowed with an honorary Doctor of Public Health was privileged to erect his totem pole with the best of them. The fact that his might be hollow and others solid made no difference to the casual observer. Doubtless, in many instances those on whom this degree was honorarily bestowed were quite worthy of the honor: men seasoned by years of experience in public health work and of proven accomplishment. In an unfortunately large number of other cases, however, recipients have not been outstanding in the field to which the degree relates. Thus, too frequently, one notes Dr.P.H. after the name of a good internist, a sound gynecologist, or some favorite son of a medical school, or learns from the brass plate on the portrait of one who was once in the upper brackets of then current medical politics that the gentleman in question was also a doctor of public health; or wonders if a former dean's reluctant resignation was not furthered by this honorary degree, and suspects that on more than one occasion commencement speakers were paid with a doctorate in public health in lieu of travel expenses.

It is to be hoped that in the future those universities which have been awarding this degree as an honorary one will find it possible to recognize meritorious service or the amenities of the moment in some other way.

# Credit Lines

A Selective Digest of Diversified Health Interests

D. B. ARMSTRONG, M.D., AND JOHN LENTZ, M.S.

## THAT ANNUAL REPORT .

What kind of an annual report should we prepare? This live and generally perplexing question always crops up at this time every year. It is a question that deserves our best thought, for effective annual reports can most assuredly "win friends and influence people." Yet, distinguished annual reports are few and far between in the health field—due perhaps to the fact that too many of us consider them necessary evils, rather than statements which may create confidence in and respect for an agency's work.

What is an annual report? Perhaps it might be wise for all concerned to think about this question before attempting to write an account of the past year's activities. An annual report, we would say, is a statement which, with clarity and sincerity, interprets an organization's program, its policies, its background, its plans, its financial position, and its potentialities so as to gain the sympathetic support of an informed public.

Some time ago a public relations agency classified annual reports under three major headings: (1) The Poker Face Type, (2) The Beautiful, but Dumb Type, and (3) The Man-to-Man Type. The first, or Poker Face type, contains little else but a financial statement with perhaps scanty references to the organization's work. The second, or Beautiful, but Dumb type, is

"dressed up" with fine paper, excellent typography, and striking illustrations—but sets forth little information. The third, or Man-to-Man type, is written and illustrated to conform to the thinking of average people. It leaves readers with very definite ideas about an organization and creates appreciation for the organization's services.

The agency referred to above also found through a survey that many annual reports are difficult to understand. The most popular kind of report was found to be the narrative type which presents a detailed story of an agency's work and progress.

Here are a few "tips" to remember as your 1941 report matures:

1. Decide which group or groups in your community are most interested in the work of your agency and fashion your report accordingly.

2. Do not try to tell "everything" that was done during the year. Stress your major accomplishments. Routine work can be reflected in brief resumés or statistical tabulations.

3. Don't be too "long winded." People like reports that are quickly grasped.

4. Use as many illustrations as possible: photographs, diagrams, charts, pictographs, insignia, maps, reproductions of letters, portraits, and the like.

Let's have more "Man-to-Man" annual reports from health departments and related agencies this year!

## THE PLAY'S THE THING

There has been marked improvement in programs which health educators arrange for the public. Not long ago

Please address samples of printed matter, comments, or other editorial contributions to the editors at One Madison Avenue, New York, N. Y.

the typical health meeting consisted of a lecture and the distribution of literature. This type of meeting soon lost its appeal and the motion picture was introduced to bolster attendance. There is now a trend toward presenting brief health plays at these meetings and when well done, they "go over with a bang"—as the theater manager would put it.

Many health meetings are now devoted to the subject of nutrition. This is a topic on which interesting and instructive lectures can be based. It is also a subject around which several good motion pictures have been developed. Now there is a play available on the subject which should be a welcome addition to any nutrition program for the general public. The play is entitled "The Angry Men" and its authors are Norman L. Burnette and Ella Monckton.

"The Angry Men" dramatizes the story of "four deaths, grim as the Horsemen of the Apocalypse: scurvy at sea, beriberi in the Orient, pellagra in the cotton fields, and rickets in the nursery." It tells how these four deaths were conquered by men of science—Eijkman, Funk, Goldberger, and others—through the discovery of vitamins. The play is presented in four intensely interesting episodes, giving the historical background of our present knowledge of vitamins. The dialogue throughout is expertly written.

Copies of "The Angry Men" are available without cost from the authors at 180 Wellington Street, Ottawa, Canada. The authors recommend that the play be used as a "curtain raiser" at nutrition meetings and that a film and a lecture be included on the program also. Complete stage directions and other production details are given by the writers in order that amateur groups may present a finished performance. A cast of twelve is required to enact the various rôles. If facilities for

staging the play are not available, the dialogue might be read by someone skilled in dramatic interpretations.

#### T.V.A. VS. MALARIA

The Health and Safety Section of the Tennessee Valley Authority has made a number of notable contributions to the science of malariology. The Authority's medical, entomological, and engineering studies in this field are rightly hailed as outstanding public health achievements. Integrated with the Authority's scientific studies, is an intensive health education program. Three excellent bulletins, designed for community groups and schools, have recently been issued by the T.V.A. to implement its educational campaign against this disease.

"Malaria—The Story of an Individual Problem and a Community Problem" is the title of one of the Authority's bulletins. It is a splendid example of the art of interpreting highly technical facts so as to make them intelligible on the third grade vocabulary level. The bulletin, however, does not "put over" its story by words alone. Every page of the publication carries one or more well chosen photographs to illustrate each major point set forth in the text. Of unusual interest are the pictures showing various phases in the life cycle of the mosquito. The basic facts about malaria have never been more successfully and attractively set forth than in this bulletin.

Two other bulletins which the Authority is utilizing in its program for malaria control are addressed to teachers, students, and civic leaders. Basic information on the disease and suggestions for community-wide educational programs are stressed in these publications. Communities making use of these handbooks will find that they are excellent "blue prints" for action against the *Anopheles* mosquito.

From the Authority also comes a

mimeographed report entitled "Malaria in Our Community." This tells of a project in which school administrators, teachers, students and health authorities coördinated their efforts in a malaria control program. The rôle which education plays in the prevention of disease is convincingly demonstrated in this report.

Inquiries concerning these publications (which we hope many health educators will read) should be addressed to the Health and Safety Section, Tennessee Valley Authority, Chattanooga, Tenn.

#### HAVE YOU SEEN . . .

##### *The Story of the National Foundation for Infantile Paralysis?*

In this booklet the Foundation "introduces itself" to the public. In question and answer form, information about the Foundation, its work and the disease it is pledged to fight is set forth. The publication gives a very clear and comprehensive picture of the scope of the Foundation's program. Other noteworthy features of the booklet include an introductory statement by the President of the United States and a foreword by Basil O'Connor, head of the Foundation, in which an appeal is made to every American to help stop infantile paralysis in "its mysterious march of distortion." The Foundation is to be commended on the appearance and content of its publications. They are invariably neat in format and are well written. Copies of "The Story of the National Foundation for Infantile Paralysis" may be had by writing to the Foundation at 120 Broadway, New York, N. Y.

##### *Hidden Hungers in a Land of Plenty?*

This is a handbook issued by the National Maternal and Child Health Council, 1710 Eye Street, N.W., Washington, D. C., at 25 cents per copy. It is essentially a compilation of eight

nutrition projects designed to help communities adapt themselves to the broad social changes that are taking place today. The suggested projects outline ways and means to bring about the application of the recommendations made at the National Nutrition Conference in May, 1941. The plan of action suggested in each project is excellent. This handbook should be very helpful to all groups engaged in nutrition programs. Mrs. Franklin D. Roosevelt gives the handbook her blessing in a foreword.

##### *Community Committees for Dental Health*—and other publications issued by the National Dental Hygiene Association?

This association, through its publications and other educational activities, is attempting to create a definite lay interest in the dental problem. The publication—Community Committees for Dental Health—describes the magnitude of the dental health problem today and offers suggestions for the development of specific community programs to bring about its eventual solution. The Association also has other literature available including two popular leaflets entitled "Without Warning" and "Some Modern Facts about Healthy Teeth." If interested, write to the Association—934 Shoreham Building, Washington, D. C.

##### *Public Health Progress?*

This is the title of the annual report of the Public Health Federation of Cincinnati, Ohio. It is a simple 4 page folder in which the past year's activities are briefly explained—so briefly, in fact, that the cover page carries this notation: "Reading Time—Five Minutes." In view of the anticipated paper shortage, annual reports fashioned along the lines of this one might well take the place of more elaborate reports for the duration.

### 100 Years of Medicine in Minnesota?

The Minnesota State Medical Association has published a pictorial document under this title commemorating a century of medical progress in that state. The story is an inspiring one and this publication is a fitting tribute to the men and women who pioneered in "frontier medicine." Public health activities in the state are given due recognition in the pages of this publication—the activity of nurses, laboratory workers, and vital statisticians being singled out for especial comment. Inquiries concerning this impressive publication should be sent to the Minnesota State Medical Association, 493 Lowry Medical Arts Building, St. Paul, Minn.

### E.D.C. CAMPAIGN

The printed materials produced by the National Tuberculosis Association each year for the Early Diagnosis Campaigns have always been outstanding examples of health publicity. The 1942 materials, however, surpass those issued in other years. The posters, leaflets, and manuals for the 1942 drive certainly reflect credit on the very able staff that planned them. All these publicity items are admirable from an educational point of view. Moreover, they are attractively executed. That a great deal of inspiration and imagination went into the production of these materials is clearly evident.

This year's E.D.C. has three objectives as regards tuberculosis: Find It—Treat It—Conquer It. Three posters, one of which is for display in localities populated by Negroes, stress these objectives so forcefully that "Find It—Treat It—Conquer It" will be remembered by many wherever the posters are displayed. A 32 page manual for volunteer workers is also included among the new E.D.C. materials. This includes organization charts, publicity pointers, and many other features which will be immensely helpful in the con-

duct of the campaign. There are also three new leaflets for this year's drive—one on case finding called "Element'ry, My Dear Holmes," one on treatment with the title "If It Happened to You," and one on the community program and the work of tuberculosis associations entitled "Puzzles Are Easy—If One Knows the Answers."

Since successful campaigns depend largely upon publicity materials, the 1942 Early Diagnosis Campaign should set a record for accomplishment. This annual drive is worthy of the support of all interested in public health.

### MAGAZINE ARTICLES

Current popular magazine articles on health or of medical import:

"What to Give a Hospital Patient." Julia DeBarry. *Good Housekeeping*, January, 1942

"A Good Look at Psychoanalysis." Maxine Davis. *Good Housekeeping*, January, 1942

"X-Ray Marks the Spot." Margaret Barnett. *Coronet Magazine*, January, 1942

"Catching Cold—Which Kind?" Greta Palmer. *Cosmopolitan*, February, 1942

"Can They Have Children? (The Rising Problem of Sterility and Infertility)." Albert Horlings. *Harper's Magazine*, January, 1942

"Your Appendix." Louise Fox Connell. *You Magazine*, January, 1942

(The above is not presented as a complete list and the articles cited are not necessarily recommended.)

### HOW TO "KEEP POSTED"

The torch of scientific research today burns high. As a result, a constant stream of discoveries—particularly in medical science and public health—issues from educational and research centers at a bewildering rate. Do you not have difficulty, for instance, in keeping up-to-date on the latest vitamins or

the latest sulfa drugs? Certainly many of us do. It is almost impossible to keep track of scientific advances unless one has an unlimited amount of time to read a host of scientific journals—or unless one has steady access to such a publication as *Science News Letter*. Health educators who have not utilized *Science News Letter* as a medium for keeping abreast of current scientific progress should look over a few copies of this weekly magazine. Then and there it would no doubt become the number one publication on your professional reading list.

*Science News Letter* is published by Science Service, an independent non-profit agency that "feels and reports the pulse of science day by day." Its writers interpret original research and report other happenings of scientific import in a concise and easily read manner. The articles in this publication are based on authoritative data, thus assuring readers of only the most trustworthy information.

See a copy of this publication and decide for yourself as to its usefulness. Subscription rates may be had by writing to Science Service, 1719 N. Street, N. W., Washington, D. C.

#### AN EDITORIALETTE:

##### HEALTH EDUCATION—THE ENZYME

While health education is one of many elements in the public health picture, it is different in character from any of these elements. It is not *just* "one other thing" in preventive medicine. It is or should be an ingredient in all of the basic services in preventive medicine. All other services should be shot through with it or illuminated by it. It is actually or potentially inherent in all of them. It might perhaps be called the enzyme in the process. In the digestive process are involved the mucous membrane of the gastrointestinal tract, the cells of the villi of the intestinal walls, the blood vessels, the

cells of the blood stream, the musculature, and the constituents of the food itself. These all have to be there and all have to do their part. They constitute the basic essentials. But their efficiency and thoroughness are stimulated and released by the effect of the digestive enzyme upon them. Now, in public health, within the school walls, for instance, health education bears a similar relationship to the doctor, the nurse, the clinic, the laboratory, and the other personnel and equipment. Perhaps the analogy has flaws—doctors are apt to do some good in just examining and treating children, with little or no health educational motive, while digestion won't take place at all without the enzyme. Nevertheless in schools, in health centers and clinics, in industry, and in all phases of the public health program, it is the enzyme "health education" that implements and activates its associate forces in the coöperative effort to prevent disease, promote health, and build the vigor and endurance demanded by the stress of living in our time.

(EDITORIAL NOTE: Won't you help us continue this series of "editorialesques?" There must be many subjects in the field of health education upon which you would like to express an opinion. Let us have your thoughts on any of these subjects. You may praise, criticize, or philosophize—provided it is done in not more than a hundred words. While we cannot guarantee publication, serious consideration will be given to your contributions.)

#### JOTTINGS

Here's another slogan for health workers and everyone else to remember throughout this period of strife and struggle: "Keep Your Chin Off Your Chest!" . . . The story of the discovery of ether is now being filmed in Hollywood. The picture, of feature length, will be called "Triumph Over

Pain." . . . The *New Yorker Magazine* relays the story of a woman in Harrisburg, Pa., who was found to have been sticking anti-tuberculosis Christmas seals on her chest for years as a precaution against the disease. . . . Sidelight on an adversary, as reported in the *New York Times*: "A serious problem of Japanese man power is inherent in the high percentage of soldiers infected with venereal disease. Among the old China hands in Shanghai there is a grim joke to the effect that syphilis has disabled more Japanese than have Chinese bullets. It is claimed that Japanese medical officers can no longer cope with the situation. Syphilis is said to have incapacitated the equivalent of several Japanese divisions." . . . The patriotic motif is now used on many types of health publicity. Here are some important points to remember in this connection: (1) Always

show The Flag pointing to its own right—never show it pointing to its own left, (2) Never show The Flag draped or festooned, (3) Never print The Flag on the face of envelopes where the cancelling of stamps might mutilate it, (4) In using the national colors, the correct sequence is: blue first, white second, red third . . . Line from a Broadway play: "As soon as he entered the hospital, he took a turn for the nurse." . . . Little wonder that William Henry Welch was such a beloved figure, as he was intensely human. The Welch biography (which we again urge you to read) reveals that two of his "weaknesses" were "hot dogs" and Coney Island's chute-the-chutes. . . . The British Library of Information, 30 Rockefeller Plaza, New York, N. Y., has many interesting publications on health under wartime conditions. These are available without cost. . . .

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WANTED: The following issues of the *American Journal of Public Health*—April, 1911; February, 1937; January, 1938; February, 1939; July, 1941; and August, 1941. The American Public Health Association will be glad to pay postage for the *Journals*.

## BOOKS AND REPORTS

*Strange Malady* — By Warren T. Vaughan, M.D. New York: Doubleday Doran, 1941. 255 pp. Price, \$3.00.

*Strange Malady*, as the title implies, suggests that the reader is about to encounter a discussion of one of the human ailments concerning which little is known. However, after perusing the 255 pages of Dr. Vaughan's book, the layman will undoubtedly come to the conclusion that great progress has been made by scientists, both in Europe and in America, during the past twenty years, toward the solution of these strange allergic manifestations. It is to allergy that Dr. Vaughan has given his appropriate title.

The book is divided into five parts. The history of allergy should be of special interest as Dr. Vaughan has had the opportunity, because of his distinguished father's associations, to meet at first hand in his own youth a number of the early students of this specialty, and to acquire from his father intimate details and anecdotes of the work and habits of these scientific men.

In part two the discussion of allergy and the relation of one manifestation to another is linked together in such a concise style that the reader might assume after all the problem is quite simple, and that the solution of the mystery depends only on a careful study of the patient's environment and the history of events in the progress of the disease. This assumption might be correct in a limited number of the victims; the history is most important. But often the patient still "lives" a miserable existence in spite of most careful investigation; and to this sick individual Dr. Vaughan's title can be aptly applied.

The author touches briefly on the treatment of allergy in part three. He devotes only 14 pages to this phase of

his publication. He must have given careful thought to his final decision to limit this discussion to the barest details. Only confusion would have resulted had he attempted to present the many procedures with which the allergist attempts to relieve his patient.

Part four begins with the statement that "Sensitization to foods is the commonest form of human allergy." The reviewer takes exception to this statement, disagreeing with the opinion of Dr. Vaughan and other members of this school of thought. It is unfortunate that he has placed such emphasis on "food allergy." Many of the conservative allergists will not agree with him as he has no scientific proof to substantiate such a broad generality. Likewise, many trained internists will heap criticism upon his head if they read this book. There are individuals who are specifically sensitive to certain foods, a small minority in the opinion of the reviewer. The statement would have been better and more accurate had he emphasized that often an inexperienced or over-enthusiastic allergist confuses the digestive symptoms of a patient, who is nervous and harassed by financial or domestic problems, for gastrointestinal or "food" allergy. Fortunately in part five the author mentions the possibility of such confusion.

Thus with one exception, and an important one, the book contains many entertaining and instructive characteristics of a fascinating and baffling variety of affections.

Mr. Tillery's illustrations are unique and amusing, but at the same time they portray accurately many of the complicated problems of immunity and they greatly enhance the value of the book to the reader.

LESLIE N. GAY



**Housing Yearbook** — Coleman Woodbury and Edmond H. Hoben, Editors. Chicago: National Association of Housing Officials, 1941. 399 pp. Price, \$3.00.

Local housing developments during 1940 and early 1941 are rather fully reviewed state-by-state and city-by-city in the principal section of this seventh *Housing Yearbook* of the National Association of Housing Officials, which constitutes the definitive record of recent progress on the fronts of construction, management, and public relations. Each of the federal housing agencies is represented by a summary of its current program, and several new organizations created to deal with emergency needs for defense housing facilities have contributed reports on their purposes and early accomplishments.

In addition to the usual directory of official and unofficial housing agencies, the volume contains a special report on the organization, research programs, legislative activities, budgets and methods of financing, etc., of 19 of the leading local housing associations. This analytical study sheds valuable light on the methods by which effective voluntary housing organizations can best be developed, and should be helpful to all those who have occasion to work with citizen housing groups in their own communities. ALLAN A. TWICHELL

**Nutrition in Everyday Practice**—*A Compilation from the Canadian Medical Association Journal*—1938–1939. Evansville: Mead Johnson, 1939. 94 pp. Paper. Free.

This excellent little volume is a compilation of "eighteen authoritative articles on normal nutrition which appeared regularly during 1938 and 1939 in the *Canadian Medical Association Journal*." These articles as chapters, each by a different author, are of the length of a 15 minute radio talk, which several of them actually were. They adequately

cover the subject of nutrition from a practical standpoint and should be admirably suited for instructing the physician or public health officer in "Nutrition in Everyday Practice." That this volume would not be suitable for a textbook in nutrition in no way detracts from its usefulness for the purpose stated in its title. Chapter subjects include: calories, protein, fat, pregnancy, lactation, childhood, calcium, bread, iron, iodine, canned foods, resistance to disease, and several general discussions of nutrition and feeding.

The importance of a nutrition improvement program for every public health administrator is being increasingly recognized. If lack of knowledge of the science of nutrition holds some back, a good practical guide, such as this little volume is, will be helpful and stimulating. A paper covered edition has been printed and is being distributed by Mead Johnson and Company.

D. F. MILAM

**The Public Health Nurse in Action**—By Marguerite Wales. New York: Macmillan, 1941. 437 pp. Price, \$2.75.

Here is a book that was needed, for it makes interesting reading of what public health nurses do in the city and in the country. Nursing procedures have been omitted, but there are ample references to standard manuals and texts for those who want that kind of information. Both layman and professional health worker will find this book informative. It should prove helpful to college students seeking literature for vocational guidance, and particularly to the nurse student who has yet to choose her field of nursing. I hope also that board members and health officers will read this book, for it will make them proud of their public health nurses.

The foreword by Lillian D. Wald, founder of the Henry Street Visiting Nurse Service, sets the scope and tone of the book which is sustained through-

out its ten chapters. The author presents some of the principal fields in which nurses are engaged and also those diseases which constitute the greatest menace to public health, such as tuberculosis, syphilis, gonorrhea, and chronic illness. Each chapter begins with a brief statement of the health problems in this particular field as they affect the community and the nation, followed by illustrations of what they mean to individuals and their families and what the public health nurse does to help them help themselves. Some of the characters in the case stories will linger in the reader's memory, as little Dolores Acosta, a plucky child with a bad heart, and her determined mother, do in mine.

In the last chapter, Miss Wales reaffirms her belief in the importance of the work of the public health nurse. She speaks of her as "a galvanizing agent. Hers is the responsibility of keeping plans alive and seeing that they are carried out." I believe that everyone who reads this book will agree with the author.

EMILIE G. SARGENT

**Nutritional Deficiencies**—By John B. Youmans, M.D., assisted by E. White Patton, M.D. Philadelphia: Lippincott, 1941. 385 pp. Price, \$5.00.

This book, primarily intended for practitioners of medicine, is apt to be invaluable to all physicians and particularly to teachers of medicine and nursing. The subject matter deals with human deficiency disease rather than data obtained from animal experimentation and empirically applied to the human subject. Ill health resulting from inadequate intake or utilization of protein and essential minerals receives equal consideration to that given to the avitaminoses.

The inadequacy of present knowledge of human deficiency diseases is emphasized, and always the author's attitude is conservative. The problems of human nutritional disease are clearly stated and

the various conditioning factors defined. Protective, preventive, and curative therapy are differentiated and accurately outlined.

The chemistry and biochemical significance of the known vitamins are presented as adequately as present knowledge of their functions can be translated into clinical terminology. The same is true of the discussion of protein and the essential minerals. There is an excellent tabular summary of the vitamins and an equally good guide to the important food sources of the essential nutritive factors.

The final section describing the best current laboratory methods for diagnosis of nutritional deficiencies will be of great importance to all physicians with access to good clinical laboratory facilities as well as those interested in nutritional research. No better presentation of the laboratory diagnosis of deficiency disease has appeared.

The book can be recommended as an accurate and authoritative source of information for all who are interested in the clinical and biochemical problems of nutritional disease.

V. P. SYDENSTRICKER

**Hippocratic Medicine, Its Spirit and Method** — By William Arthur Heidel. New York: Columbia University Press, 1941. 149 pp. Price, \$2.00.

The small book *Hippocratic Medicine* by the late Professor William Arthur Heidel is one to be owned, to be kept handy on one's bookshelf, to be read several times and to be consulted frequently. It is a work suited to serve for the tyro as an introduction to Hippocratic medicine, and for the more mature student as a reference work, an epitome, and a digest of medical thought and science during the Periclean Age.

The tyro will do well to pass over the parts beyond his grasp, while the better versed will find the whole work stimu-

lating and instructive. The book is not difficult to read, or to understand. Its author, however, was a master in his field and he plays upon themes and personalities with the ease and flash of a virtuoso.

This, too, is a timely work. Modern medicine has reached the stage of synthesis, where its many heretofore isolated parts fall into a harmonious rational pattern. *Hippocratic Medicine* will aid us to grasp the transcending significance of this experience. It will sharpen our wits to appreciate the new—ancient medical problems, those of nutrition, of the total man and his environment, of the interrelationship between macrocosm and microcosm, problems of utmost importance to the public health worker and the physician.

To the Josiah Macy, Jr. Foundation, which by a grant to the author, made the composition possible, and to the Columbia University Press, which published it, medicine and public health are indebted for a significant and valuable contribution to the cultural wealth of The Art.

IAGO GALDSTON

**Lymphatics, Lymph, and Lymphoid Tissue—Their Physiological and Clinical Significance—***By Cecil Kent Drinker and Joseph Mendel Yoffey. Boston: Harvard University Press, 1941. 406 pp. Price, \$4.00.*

This volume is Number Two of the Harvard University Monograph series in Medicine and Public Health.

The book is divided into two major parts: Dr. Drinker, the senior author, has written the first five chapters, which pertain largely to the anatomical and physiological features of the lymphatic system. He discusses the permeability of blood capillaries, the permeability of lymphatics, lymph flow and lymph pressure, and the chemical composition and physical characteristics of lymph.

Dr. A. Baird Hastings, Professor of Biological Chemistry at Harvard Medi-

cal School, has collaborated in chapter 5, on the electrolytes of lymph.

The junior author, Dr. Yoffey, is interested in the lymphoid tissue primarily, as contrasted with the functions of the lymph and its movement, and has contributed chapters 6, 7, and 8, on the biological significance of lymphoid tissue, the cell content of lymph, and the lymphocyte. The final chapter, by Dr. Drinker, deals with the practical considerations that may be related to the matters previously discussed in the monograph.

This comprehensive and extraordinarily fine monograph is a brief summary of the years of strenuous and fruitful work that have been devoted to the study of a relatively unexplored field. It is an authoritative text, which should be on the shelves of every medical library. The bibliography is comprehensive and an important asset to the text.

W. G. SMILLIE

**Occupational Diseases—***By Rutherford T. Johnstone, M.D. Philadelphia: Saunders, 1941. 524 pp., 132 ill. and 26 tables. Price, \$7.50.*

The question of workmen's compensation does not usually enter into the relationship between a physician and his patients, even though many of them are working people. However, with an employed group of 52,000,000 people, many cases will arise which pertain to employment—and in some of them the question of responsibility will be uncertain. The adequate handling of such cases demands that the physician know and understand the obligations placed upon medical practice by workmen's compensation. This book will show him how to do this. It excellently describes these obligations and gives instructions how to comply with them. It will be of great value to both the industrial physician and the general practitioner and is definitely an important contribution to industrial medicine.

Part I discusses the functions and administration of workmen's compensation, including methods of evaluating disability.

Parts II to VIII consider the occupational diseases incident to skin irritants, the use of toxic materials, dusts, environmental conditions, etc. Their sources, prevention, diagnosis, treatment, and medicolegal aspects are discussed.

Part V concerns the handling of two of the most troublesome problems of industrial medicine and compensation—the "industrial back" and hernia.

Part VIII relates the medicolegal relationships of trauma to disease and to the neuroses; while the last chapter deals with the preemployment examination.

This book will do much to aid the general practitioner as well as the specialist in the field of industrial medicine. Its publication is very opportune during this period of national emergency when the importance of the health of the defense workers is recognized and the general practitioner's opportunities in industrial medicine are steadily increasing.

C. D. SELBY

**Prepayment Plans for Medical Care—***By Franz Goldmann, M.D. New York: Joint Committee of the Twentieth Century Fund and the Good Will Fund; and Medical Administration Service, Inc., 1790 Broadway, 1941. 60 pp. Price, \$.25.*

This small but very substantial pamphlet first discusses the general principles of voluntary prepayment of medical care and then gives a comparative study of 5 plans of organized medical care for self-supporting people. All 5 use group practice to furnish medical service, and all use clinics of their own as the basis of their activities. They differ in so far as 2 are organized as consumers' coöperatives, 2 are connected with group clinics oper-

ated by private physicians, and 1 is under the management of an industrial corporation. The main purpose of the study was to find out how complete the scope of the services offered was and, second, how much the medical care furnished actually cost.

It is impossible to go into detail, but the pamphlet can be recommended most warmly. Goldmann has carried out his study carefully and critically, and the facts and figures he gives will be found most useful. Medical service plans of varying types have been operated in this country in the last ten years in increasing numbers. Much valuable experience has been gained, and I wish Dr. Goldmann would analyze, summarize, and criticise it in a book that would include all these plans. Such a comprehensive study would be of greatest value when the country gets ready for its Second National Health Program.

HENRY E. SIGERIST

**L. Baxter, *Medicus* —***By Knud Stouman. New York: The Greystone Press, 1941. 406 pp. Price, \$2.75.*

Knud Stouman is well known to many workers in public health for his statistical studies with the League of Nations and the League of Red Cross Societies, and for his admirable report (co-author with I. S. Falk) on "Health indices. A study of objective indices of health in relation to environment and sanitation" (*Quarterly Bulletin, Health Organisation, League of Nations*, 5:901, 1936).

In "L. Baxter, *Medicus*," Mr. Stouman has written a leisurely and charming novel of the late 17th century, working up toward the end to crises of vivid dramatic interest. The hero is a medical apprentice in New York, a medical student in Holland and England, and a practitioner again in New York. He and his associates are vital personalities painted against a historical background that is always pic-

turesque and accurate, but never obtrusive. Both Leeuwenhoek and Sydenham appear in person in the course of the narrative. Public health workers will be particularly interested in the historically plausible demonstration of variolation and in the account of the first official American autopsy actually performed by Kerbfile in 1691 under the conditions described in the novel as applying to Dr. Baxter.

C.-E. A. WINSLOW

*Administrative Medicine*—*Edited by Haven Emerson, M.D. New York: Nelson, 1941. 839 pp. Price \$7.50.*

The fields of public health and of medical care have now so far overlapped that it is timely and interesting to find them both treated in a single volume and under a new name. Dr. Emerson has called on as many as fifty-six authors to discuss the various phases of work in these related fields and presents their contributions, with an introduction of his own, in a sizeable volume bound in loose-leaf form.

Designed primarily for the medical practitioner, specifically in the words of the editor, "to correct a common tendency among physicians to concern themselves only with the medical and health needs of their own patients," the usefulness of the book is by no means limited to this class. It may tend also to correct a common tendency of health workers to concern themselves only with their own peculiar problems.

To the health worker the section on public health will attract first attention. It is in fact a series of essays on the various phases of public health organization and administration. These essays contain a wealth of information, much of which is not elsewhere available. The individual contributions are for the most part of high quality, although, as is inevitable in multiple authorship, there is some repetition and some lack of unity and balance. In

spite of these minor defects, however, the public health worker will find this part of great interest and value.

The discussion of the organized care of the sick is somewhat unusual. Hospitals and their allied services are treated fully and effectively and there are excellent chapters on visiting nursing, on sickness surveys, on home medical care, on the medical service of the military forces and on university health services. Only in the final two chapters of the book is attention given to the most important of all pending questions in administrative medicine, the organization of medical service for those able to pay all or part of its cost.

The final chapter, entitled "The Economic and Social Basis of Administrative Medicine," makes clear that medicine can never make its full contribution to society until existing economic barriers to the extension of medical service are removed. It is on this note, surprisingly enough, that the book closes.

The book is a real contribution to the all too scant literature of the subject and will be welcomed by all workers in public health and its allied fields. To the many contributors and to the editor are due the thanks of us all.

A. W. FREEMAN

*An X-ray Atlas of Silicosis—By Arthur J. Amor, M.D. (Lond.), M.Sc. (Wales). Baltimore: Williams & Wilkins, 1941. 206 pp. Price, \$8.00.*

This is an altogether admirable book and great credit is due to the author and his collaborators. The material is presented in a clear, brief, and succinct manner that tells the story without the wastage of a word. The chapter on the etiology of silicosis embodies not only a great deal of experience but emphasizes the different conditions that exist in various types of industry, without an appreciation of which the clinical picture of silicosis must always be confusing. The main body of the book is

devoted to reproductions of x-ray films of the chest. These reproductions are very well done and are accompanied by a full account of the working and clinical history of each individual. Some of the films are in series. Various stages of silicosis are shown with and without infection. The film reproductions also illustrate the appearances that are seen in different types of industry and it is the demonstration of this, together with the pertinent data, that gives this book its particular value. There is an interesting foreword by Sir Wilson Jameson.

A. J. LANZA

**Play for Convalescent Children in Hospitals and at Home**—By *Anne Marie Smith*. New York: Barnes, 1941. 133 pp. Price, \$1.60.

A new note in the convalescent care of children is struck in this helpful little volume.

The author recognizes that it is the whole child who is sick and not any one organ or organ system. The processes of repair therefore demand treatment of the total personality. It is estimated that 40 per cent of a child's day in the hospital is occupied by physical care. The problem is to fill up constructively the other 60 per cent.

From a wealth of experience in The Children's Memorial Hospital in Chicago and in other institutions the author has worked out a systematic program of play activities for convalescent children based upon modern principles of child behavior. An excellent chapter on the organization and administration of a "Department of Play" gives the basic requirements. This is followed by a chapter on the practical application of play activities and their uses under varying conditions. Suitable types of play material for children at different age levels are given a place. Children's favorite story books are listed. A unique chapter on the classification of tested forms of play indicates the practical

application under hospital conditions. A well selected bibliography is appended. This book is highly recommended for nurses and hospital social service workers. RICHARD A. BOLT

**Obstetrics for Nurses**—By *Joseph B. De Lee and Mabel C. Carmon* (12th ed.). Philadelphia: Saunders, 1941. 651 pp. Price, \$3.00.

This new edition of one of the standard texts in obstetrics for nurses is brought up to date by the addition of recent statistics, descriptions of new procedures, and new illustrations. The character of the text is not changed and largely represents the teaching and practices of one institution.

The statement which appears on page 549, "The subject (of pelvimetry) is far too complicated and extensive for full presentation in a nurses' textbook . . .," suggests the philosophy that has influenced the presentation of the subject matter throughout the book. The nurse with a real desire to understand the physiologic processes of maternity in relation to obstetric procedure will find the book inadequate.

HAZEL CORBIN

**Encephalitis: A Clinical Study**—By *Josephine B. Neal, M.D., Sc.D., F.A.C.P., and Associate Authors*. New York: Grune & Stratton, 1942. 563 pp. Price, \$6.75.

This book surpasses the expectation of the most critical reader. Its title is modest, to say the least, for it has been given to an outstanding work which represents an exhaustive study of epidemic encephalitis by a foremost authority on the subject. The reader will find a wealth of information on each individual type of the large group of known encephalitides; such disease entities as the St. Louis and the Japanese B types, human encephalitis caused by the viruses of eastern and western equine encephalomyelitis, Russian verno-estival

tick-borne encephalitis, the Australian X-disease, lymphocytic choriomeningitis, louping-ill, the Guillain-Barré syndrome, toxoplasmic encephalomyelitis and hemorrhagic encephalitis are discussed in proper perspective. The material is logically arranged and clearly presented by Dr. Neal and her collaborators: Drs. Bender, Harrington, Muckenfuss, Putnam, Rosner, and Stevenson.

The text is well illustrated with 40 figures and tables; there are over 100 selected case histories and over 600 references arranged in sequence at the end of each sub-chapter of the book. The author and her associates present a complete picture of epidemic encephalitis in all its aspects: epidemiology; clinical course in acute, intermediate, and chronic phases of the disease, supplemented by discussion of the symptomatology, laboratory aids, differential diagnosis, prognosis, and causes of death. Therapy is fully discussed and augmented by the author's extensive clinical experience. Surgical treatment of post-encephalitic symptoms is given due consideration. Chapters on psychiatric sequelae; post-encephalitic behavior dis-

orders of childhood and on pathology give much valuable information that would otherwise require hours of search in medical libraries. It is interesting to note the review of data on neurological complications following acute infections and vaccination as well as the discussion of the pathology in parasitic encephalitis, the encephalopathies and in botulism. The excellent clinical work of the Matheson Commission for Encephalitis Research is cited in the text.

Every public health worker will profit by frequent reference to this volume, which is written in a clear style and reads like an adventure story; the publishers deserve special mention for the fine finished product and selection of the readily legible type. The health officer, the diagnostician, the epidemiologist, as well as the laboratory and follow-up workers, will find in this book a ready reference volume which will greatly aid them in gaining a more complete understanding of the many different forms of encephalitis. This book truly fulfils a need that has long existed in medicine and in public health.

LEONID S. SNEGIREFF

## BOOKS RECEIVED

REFUSE COLLECTION PRACTICE. By the Committee on Refuse Collection and Disposal. Chicago: American Public Works Association, 1941. 659 pp. Price, \$5.00.

NORMAL AND ABNORMAL CHILD DEVELOPMENT. By Arnold Gesell and Catherine S. Amatruda. New York: Hoeber, 1941. 447 pp. Price, \$6.50.

OUR SEX LIFE. By Fritz Kahn. 2d ed. New York: Knopf, 1942. 459 pp. Price, \$5.75.

SWIMMING. By Robert J. H. Kiphuth. New York: Barnes, 1942. 107 pp. Price, \$1.00.

DIGEST OF TREATMENT. Published Monthly, Yearly Subscription only. U. S. A. and Pan American Postal Union. Philadelphia: Lippincott. Price, \$5.00.

STITT'S "DIAGNOSIS AND TREATMENT OF TROPICAL DISEASES." 6th ed. Rewritten by Richard P. Strong. Philadelphia: Blakiston,

1942. 1828 pp. Two Vols. Price, \$21.00.

ORGANIZATION AND ADMINISTRATION OF GROUP MEDICAL PRACTICE. By Dean A. Clark and Katharine G. Clark.

BUSINESS PROCEDURES. By Perry R. Taylor. PREPAYMENT PLANS FOR MEDICAL CARE BY FRANZ GOLDMANN. By the Joint Committee of the Twentieth Century Fund of the Good Will Fund and Medical Administration Service. Boston: Edward A. Filene Good Will Fund, 1941. Each \$.25.

ALLERGY IN CLINICAL PRACTICE. By Staff Members of the Cleveland Clinic. Philadelphia: Lippincott, 1941. 354 pp. Price, \$5.00.

ATTENTION! TO YOUR HEALTH. By Ernest I. Stewart, Jr. New York: Teachers College, Columbia University, 1941. 82 pp. Price, \$.35.

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**Something New Is Added—British miscellany.** . . . Health activities of the League of Nations are being carried on from Geneva and Singapore. . . . Shelter life and general war conditions have not had a deleterious effect on health as feared. . . . It is illegal (in England) to manufacture or sell any food substitute unless licensed. . . . As rose "hips" and hawthorn berries are 6 times as rich in vitamin C as oranges, a tea of rose hips is recommended. . . . Germinated grain is a good available source of vitamins and has been widely used in India. . . . Tuberculosis in young English women 15 to 25 appears to be increasing.

ANON. Editorial Notes. *J. Roy. Inst. Pub. Health & Hyg.* 4, 11:254 (Nov.), 1941.

**Sister Kenny Deserves a Big Hand—**Having subjected the Kenny method of treating infantile paralysis to comparative studies, a committee of the National Foundation concludes that the method reduces the time of pain and spasm and the incidence of contractures and produces better end results than other methods of treatment. The committee urges health officers to be ready for the early diagnosis of poliomyelitis and to arrange for the application of the new methods. Personnel must be trained and this is another health administrative job. Just in case you haven't heard, the Kenny method abandons splinting and adopts continuous hydrotherapy and physical therapy to maintain function and increase comfort.

ANON. The Kenny Method of Treatment in the Acute Peripheral Manifestations of Infantile Paralysis. *J.A.M.A.* 117, 25:2171 (Dec. 20), 1941.

**Married Folks Really Live Longer**—It is hard to believe that the favorable mortality from tuberculosis, accidents, suicide, alcoholism, and syphilis among the married does not arise as a benefit from normal family life, even though selection is operative (marriage tends to exclude the unfit). So concludes this interesting statistical study.

ANON. Why Married People Live Longer. *Stat. Bull.* 22, 11:4 (Nov.), 1941.

**"The Time Has Come . . ."**—To put health education, and health educators, in its place and their proper places. This is the high aim of a fine, forthright discussion, which was heard by too few of us at the Atlantic City meeting.

ARMSTRONG, D. B. Health Education—An Appraisal. *J.A.M.A.* 117, 24:2060 (Dec. 13), 1941.

**Finding TB Outside the Great Cities—**Is the clinic investigating a reasonable percentage of reported cases? Is the clinic program economically justified? Has there been an increasing percentage of early cases found? Has it been profitable to examine contacts? Does the project stimulate public interest? These are all valid questions: their answer when applied to one non-metropolitan area is the basis of an excellent paper.

BLISS, T. L. Tuberculosis Case Finding. *J.A.M.A.* 117, 23:1944 (Dec. 6), 1941.

**Speaking of School Health Examinations—**Although we have a means of knowing which children in a community will grow up into physically handicapped adulthood, we have so far done precious little about it. As we are now



reaping the whirlwind of our neglect (in our selectees) this would seem to be a fitting time to do something about bettering our methods.

Ciocco, A., *et al.* Child Health and the Selective Service Physical Standards. Pub. Health Rep. 56, 50:2365 (Dec. 12), 1941.

**Big Encephalitis Outbreak—News Item**—If you feel that your knowledge of the increasingly more menacing encephalitides is a little shaky, then this brief but inclusive review will bring you up to date. The bibliography of 186 references will prove a valued addition to your working papers. There are three methods of attack with which you should be on speaking terms: extermination of the hosts, extermination of vectors, and immunization of the (human) victims.

DINGLE, J. H. The Encephalitides of Virus Etiology. New Eng. J. Med. 225, 26:1014 (Dec. 25), 1941.

**"With Eyes to See"**—Are water- and food-borne outbreaks of disease worth reporting and epidemiologic study? One state reports half of all the country's water-borne outbreaks, but this state has top notch sanitary services and supervision. Three states report over half the milk-borne outbreaks. No reports come from some states where sanitary conditions are deplorable.

FUCHS, A. W. Disease Outbreaks from Water, Milk and Other Foods in 1939. Pub. Health Rep. 56, 48:2277 (Nov. 28), 1941.

**Introducing Met and Clo**—It is suggested that these newly named units of thermal activity and insulation be used by physiologists, physicians, and heating engineers, instead of the variety of complicated terms each employs to the confusion of the others. For your information, a met is a measure of thermal activity roughly the equivalent of that of a 100 watt lamp, and a clo

has about the insulation value of your old heavy topcoat.

GAGGE, A. P., *et al.* A Practical System of Units for the Description of the Heat Exchange of Man with His Environment. Science 94, 2445:428 (Nov. 7), 1941.

**Neglected Children**—Among Chicago school children the extensive need for health supervision was made manifest by an examination of a large sample. At no family income level is the health generally satisfactory, but at the low levels it is definitely unsatisfactory—as one might anticipate.

HARDY, M. C., *et al.* Physical Fitness of Children from Different Economic Levels in Chicago. J.A.M.A. 117, 25:2154 (Dec. 20), 1941.

**Behavior of the "Bombed" Child**—Well, this is no longer merely an academic question! Air raids do affect the child though the prognosis is good (judging by this report of limited British experience) in those cases not complicated by existing neurotic trends.

MONS, W. E. R. Air Raids and the Child. Brit. M. J. 4217:625 (Nov. 1), 1941.

**Authoritatively Yet Simply Told**—What is known about thiamin, riboflavin, pyridoxin, nicotinic and pantothenic acid is told in as few and as non-technical words as is possible for so difficult a subject. Yeast, wheat germ, liver, eggs, milk, greens, and legumes furnish these chemical constituents of the vitamin B complex.

MORGAN, A. F. The B Vitamins. Pub. Health Nurs. 33, 12:711 (Dec.), 1941.

**Why Should State Health Services Be in the Health Department?**

—Tuberculosis control is carried on by a dozen different classifications of agency in as many different states: some have as many as five official departments for this one activity alone. The astounding variety of miscellaneous state agencies that have acquired responsibility for

food and drug control (ranging from slaughterhouses to beauty parlors), the multiplicity of state divisions having to do with crippled children, and the haphazard growth of all the other categories of public health administration call for clarification. This is masterly understatement.

MOUNTIN, J. W. A Plea for Unity in Health Administration at the State Level. *J.A.M.A.* 117, 23:1958 (Dec. 6), 1941.

**Alcohol and Steering Wheels—**“Bleary Eyed” is a widely popular phrase to denote one stage of intoxication. Evidently it is quite accurately descriptive as well. The visual acuity of fifty drivers was tested before and after imbibing what might be termed a snoot-full of whisky. Where a concentration of 115 mg. of alcohol per 100 ml. of blood was achieved, significant

deterioration of visual acuity occurred; but there were great variations in potential driving ability among the testees.

NEWMAN, H., and FLETCHER, E. The Effect of Alcohol on Vision. *Am. J. Med. Sci.* 202, 5:723 (Nov.), 1941.

**Understanding Human Behavior**—I suggest that you cross out the word “nursing” from the title of this excellent paper, then read it in the light of whatever your particular job may be. Paraphrasing the closing sentences: your aim is to grow in the understanding of people—their needs and ways of expressing them—so that you may comprehend their attitudes about health, and be instrumental in directing them toward that goal.

ROBERTS, D. I. Mental Hygiene in Public Health Nursing. *Pub. Health Nurs.* 33, 12: 719 (Dec.), 1941.

#### CORRECTION

IN listing public health degrees and certificates granted in the United States and Canada during the academic year 1940–1941 in the December *Journal*, page 1308, through a regrettable error the number of graduate students enrolled in public health courses at the Harvard School of Public Health was given as 51 instead of 75. The number of graduates receiving the Master of Public Health degree from Harvard was listed as 6. The number should have been 34. This changes the totals of Table 3 on page 1309 to:

Number of students registered—658; and number of graduates receiving each degree and certificate—332.

This would also change Table 4 on page 1310 as follows:

Number of graduates receiving the Master of Public Health degree—155; total number of graduates receiving degrees and certificates—332.

This also changes the summary at the end of Table 4 on page 1310 to read as follows: “In the academic year 1939–1940, 550 graduate students were enrolled as compared with 658 in the academic year 1940–1941. Graduate degrees and certificates granted in the academic year 1939–1940 totalled 331 as compared to 332 in the year 1940–1941.”

Reprints of the report with the correct figures are available on request.

# ASSOCIATION NEWS

## APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

### *Health Officers Section*

Theodore P. Day, M.D., 1905 Prospect Place, Knoxville, Tenn., Assistant Health Officer and Epidemiologist, Bureau of Health  
Earl N. Mathis, M.D., 440-A Ninth Ave., San Francisco, Calif., Venereal Disease Control Officer, State Health Dept.  
P. A. Steele, M.D., Superintendent of Health, Decatur, Ill., Dept. of Public Health and Safety  
Claude A. Thomas, M.D., District 3, Health Office, Point Pleasant, W. Va., Director

Spencer, W. Va., Sanitarian, State Health Dept.  
Lawrence R. Tabor, B.S., in C.E., P. O. Box 148, Thomasville, Ga., Public Health Engineer, Thomas County Health Dept.  
Winston B. Taylor, B.S., 209 Raleigh, Oxford, N. C., Trainee for Sanitation, School of Public Health, Univ. of North Carolina  
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### *Laboratory Section*

Elizabeth Conroy, B.S., State Laboratory, Powers, Mich., Junior Bacteriologist, State Dept. of Health  
Edward V. Lipscomb, M.S., State Board of Health, Jacksonville, Fla., Junior Bacteriologist  
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Charlotte Silverman, M.D., 615 N. Wolfe St., Baltimore, Md., Student, Johns Hopkins School of Hygiene and Public Health

### *Maternal and Child Health Section*

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### *Public Health Education Section*

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### *Vital Statistics Section*

Hannah S. Rifkind, A.B., U. S. Children's Bureau, Washington, D. C., Asst. Statistician

### *Engineering Section*

George W. Gehres, B.S., 304 High St.,

Vegas, Nev., School Nurse, Las Vegas Union School System

Dorothy A. Hehmann, A.B., 7380-A Pershing Ave., St. Louis, Mo., Executive Director, Cancer Commission of the State of Missouri

Thomas A. Hendricks, 23 East Ohio St., Indianapolis, Ind., Executive Secretary, Indiana State Medical Assn.

Kenneth MacDonald, Ph.D., 259-A Medical Laboratories, State Univ. of Iowa, Iowa City, Ia., Associate, Dept. of Hygiene and Preventive Medicine

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Frank S. Stafford, M.S., 2536 Brookside Parkway, N.D., Indianapolis, Ind., Asst. Chief, Bureau of Health and Physical Education, State Board of Health

Ora R. Wakefield, 501 Chesterfield, Nashville, Tenn., Health Coördinator, Nashville School Health Service

Herbert Walker, D.Ed., 249 High St., Hartford, Conn., Director, Health and Physical Education, Board of Education

Helga Weigert, 70 Ashland Ave., Buffalo, N. Y., Buffalo Council of Social Agencies

#### *Public Health Nursing Section*

D. Irene Bigler, R.N., B.S., 205 W. 57th St., Apt. 8a, New York, N. Y., Industrial Nursing Consultant, National Organization for Public Health Nursing

Juliana T. K. Fowle, M.A., 15th & Eoff Sts., Wheeling, W. Va., Supervisor, American Red Cross Public Health Nurses

Ann L. Graul, 39½ Fair St., Oneonta, N. Y., District State Supervising Nurse, State Dept. of Health

Frances Hillman, B.N., 102-52 62nd Drive, Forest Hills, N. Y., Public Health Nurse, New York City Dept. of Health

Augusta Mueller, 122 Chestnut St., Oneonta, N. Y., Supervising Public Health Nurse, State Dept. of Health

Hazel Shortal, 4497 Pershing St., St. Louis, Mo., Teaching Supervisor & Coördinator, St. Louis Health Div. and St. Louis Univ.

Flores I. Smart, R.N., 99 Main St., Woonsocket, R. I., Supervisor, Public Health Nursing Assn.

Ruth E. Stiles, R.N., 374 South St., Northampton, Mass., Field Nurse, Hampden County Tuberculosis and Public Health Assn.

#### *Epidemiology Section*

Walter L. Arkush, B.A., Monterey County Hospital, P. O. Box 1611, Salinas, Calif., County Sanitary Inspector, Monterey County Health Dept.

Robert G. Hinckley, M.D., 221 Melbourne St., Minneapolis, Minn., Asst. Professor, Student Health Service, Univ. of Minn.

S. J. Phillips, M.D., P. O. Box 1138, Chapel Hill, N. C., Student, Univ. of North Carolina

Leon Schwartz, M.D., S. E. Corner, 7th & Cheltenham Ave., Philadelphia, Pa., Student, School of Public Health, University of Pennsylvania

#### *Unaffiliated*

Gustave Ulloth, M.D., Ansonville, N. C., Student, Univ. of North Carolina

#### DECEASED MEMBERS

JOSE MIGUEL PENA Y HERNANDEZ, M.D., Vedado, Havana, Cuba, Elected Member 1937.

EMERSON MCGRAIL, M.D., Cleveland, Ohio, Elected Member 1919, Elected Fellow 1924.

#### NEW MEMBERS OF THE COMMITTEE ON ADMINISTRATIVE PRACTICE

THE Executive Board of the Association on the nomination by Dr. Henry F. Vaughan of Ann Arbor, Mich., Chairman of the Committee on Administrative Practice, has reappointed Dr. Haven Emerson of New York and H. A. Whitaker of Minneapolis, Minn., for 4 year terms. It also appointed Dr. George H.

Ramsey, Commissioner of Health for Westchester County Department of Health, White Plains, N. Y., for a 4 year term and appointed George B. Darling, Dr.P.H., of Battle Creek, Mich., to complete the unexpired term caused by the death of W. Frank Walker, Dr.P.H., New York, N. Y.

## EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearing house on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

### UNASSEMBLED EXAMINATIONS IN WEST VIRGINIA

The Merit System Council of West Virginia, Box 873, Morgantown, has announced that it is expected that unassembled examinations will shortly be given for the following positions in the West Virginia State Health Department.

<i>Position</i>	<i>Salary per month</i>
Chief of Medical Services.....	\$325-\$400
Ophthalmologist .....	275- 350
Director of County Health Work.....	350- 400
Director, Maternal & Child Hygiene.....	350- 400
Director, Communicable Diseases .....	350- 400
Director, Vital Statistics .....	350- 400
Director, Industrial Hygiene.....	350- 400
Assistant Director, Maternal & Child Hygiene.....	320- 375
Assistant Director, Communicable Diseases (Venereal).....	320- 375
Assistant Director, Tuberculosis.....	320- 375
Venereal Disease Consultant.....	320- 375
Senior Health Officer.....	320- 375
Junior Health Officer.....	280- 320
Health Officer Trainee.....	\$200

Residence in West Virginia has been waived in consideration of the applications for these positions. However, residents of the state may be given preference in making appointments. Complete information may be obtained by writing to the Merit System Council.

### U. S. CIVIL SERVICE COMMISSION

The Commission has announced that applications will be received for positions as Senior Medical Officer (\$4,600), Medical Officer (\$3,800), and Associate Medical Officer (\$3,200) for appointments in the Public Health Service, with the Food and Drug Administration, Veterans' Administration, and the Indian Service. Forms for application may be obtained from the U. S. Civil Service Commission, Washington.

Junior Public Health Nurse. A civil service examination for Public Health Nurse (\$2,000) has been open for some time. Nurses who have been unable to qualify for this examination because of the experience requirement now have an opportunity to qualify through a new Junior Public Health Nurse examination (\$1,800) which requires no experience. Applications are also being received for examinations now open for Junior Graduate Nurse (\$1,620) and Graduate Nurse for general staff duty (\$1,800). Further information and application forms may be obtained at any first or second class post office or from the Civil Service Commission, Washington.

### POSITIONS AVAILABLE

Young woman, trained in Home Economics, for group contact work in behalf of an important commercial organization whose products are useful in the protection of public health and the National Nutrition Program. Experience in the public health field or related fields is essential. Office in New York, some

travel involved. Write Box H, Employment Service, A.P.H.A.

Southern State Department of Health seeks physicians qualified by training and experience as County Health Officers or as Pediatricians. Write Box B, Employment Service, A.P.H.A.

Western State Department of Health

will consider applications from physicians with experience and a degree in public health. Write Box S, Employment Service, A.P.H.A.

County Public Health Nurses for New Mexico. Must have four months' post-graduate instruction under one of the recognized public health nursing courses and one year's experience. Must drive and have a car. Address inquiry to State Health Department, Santa Fe, N. M.

Physician with either public health training or experience in local health department administration to serve as health director in a county health department in mid-western state. Salary \$4,000 and \$500 travel (flat rate). Well established department with offices in attractive little city of 10,000. Write Box T, Employment Service, A.P.H.A.

Laboratory Director—Bacteriologist—\$2,400. For combined hospital and health department laboratory with staff of 10 and visiting pathologist in charge of hospital aspects. Bacteriological experience and training especially desired. Opportunities for expanding program good. Reply Box G, A.P.H.A. Employment Service.

Wanted: Trained Public Health Nurse, starting salary \$1,500 per year and traveling expense, increase to \$1,700 within 6 months. Saginaw County Health Department, Saginaw, Mich.

The State Department of Social Security and Welfare, Crippled Children's Division, of Phoenix, Ariz., has three vacancies to be filled. Examinations will soon be held for orthopedic nursing consultant, nurse-physical therapist, and medical social worker.

Further information may be obtained by writing to the Merit System Supervisor, Room 208, 128 North First Avenue, Phoenix, Arizona.

#### PHYSICIANS WANTED IN CINCINNATI

Carl A. Wilzbach, M.D., Commissioner of Health of Cincinnati, has announced that there are vacancies for white male physicians, aged 23 to 50, graduates of recognized colleges of medicine, licensed to practise in Ohio, for appointment to

the Cincinnati Health Department. Duties include surveillance over communicable disease, infant and child welfare work, medical service for sick poor, epidemiological surveys of communicable disease, examinations for work certificates, school teachers, etc., vaccination, medical school inspection. Salary \$2,640 to \$3,360 plus transportation allowance of \$240 per annum. Eligible for a retirement system. Persons interested should communicate with Dr. Wilzbach, Commissioner of Health, City Hall, Cincinnati, Ohio.

#### PUBLIC HEALTH ENGINEER

Responsible professional public health engineering involving field investigations and office studies in the application of sanitary measures. The more difficult engineering and sanitation field surveys include supervision over public water supplies, sewerage systems and sewage treatment plants and review of plans for same, and promotion and supervision of sanitation programs. Minimum qualifications: Training and experience equivalent to 3 years' civil engineering experience, including 2 years in public health or sanitary engineering; or completion of an academic year of graduate study and a year's experience in sanitary or public health engineering; and graduation from a college of recognized standing with a major course in civil or sanitary engineering. The salary range is \$205 to \$250 per month depending upon experience. Apply Box E, Employment Service, A.P.H.A.

Southwestern State Health Department seeks 2 physicians for assignment to district health units, to personally conduct several small venereal disease clinics on a rotating schedule. Experience preferred but not required. Salary \$3,000, plus actual travel allowance not to exceed \$1,200. Write Box V, Employment Service, A.P.H.A.

Middle western city, 125,000 population, seeks well trained and experienced Health Officer on full-time, with competence to administer a department and teach public health to medical students. Salary \$5,000 to \$5,500 per annum. Write Box K, Employment Service, A.P.H.A.

## POSITIONS WANTED

## ADMINISTRATIVE

Physician, M.D. Tulane, M.P.H. Johns Hopkins, age 31, experienced as health unit director, prefers administrative position in the South. A-488

Physician, age 32, 5 years clinical and administrative experience in venereal diseases, wishes administrative position in venereal disease control, preferably at state level. A-490

## HEALTH EDUCATION

Teacher and research worker, man, Ph.D., age 52. Extensive record as college professor of biology and hygiene and investigator, for the past two years engaged in research. H-499

Health Educator, Negro, man with background of High School administration and M.S.P.H. from University of Michigan, seeks position in Health Education. Public agency or educational field. Excellent references. H-497

Woman, M.S. in public health, excellent graduate training in education, 8 years' experience as business executive (sales and publicity). Just completed year's research in community education. Seeks good administrative position. H-496

Health Educator, M.A. in Education, 10 years' background in community organization for public health education, also teaching of personal and community health at high school and college levels. Public health nurse, able to teach mental and social hygiene as well as general health education. East preferred. H-498

Health Educator. Man with M.S. in preventive medicine and public health. Negro. Seeks position in Health Education or field work with official or non-official agency. H-500

Woman with master's degree in health education, 12 years' successful experience in public school and college teaching, administration and research. Will consider position in normal school, public schools,

or in official or nonofficial health agencies. Prefers South or East. Available at once. H-501

## LABORATORY

Milk Sanitarian and Technologist, age 37, Ph.D. Bacteriology, Wisconsin, 10 years' experience in milk and food sanitation from industrial and official angle, seeks administrative position with opportunity for research or investigational work preferred. L-381

Chemist, Sc.D., Biochemistry, Johns Hopkins University. Age 31. Public health laboratory experience, teaching experience. Desires position with promise of advancement, preferably in commercial organization. L-461

## SANITARY ENGINEERING

Public Health Engineer, M.S. Harvard, experienced in public health and industrial hygiene, wishes position of better sort in public health engineering or industrial hygiene. E-470

Public Health Engineer, M.S. Harvard, with more than 10 years' experience including 5 years with state division of sanitation, is available. E-468

## STATISTICAL

Woman with academic, business and research experience in vital statistics, seeks a position in the vital statistics division of a state or city health department, preferably as registrar. S-459

Experienced and well trained public health nurse, with background of tuberculosis, venereal disease, school, industrial, and generalized services, will shortly be available for appointment. Three years as director of state nursing service. Experienced as university teacher of public health nursing. M.A., New York University. M-449

# Opportunities Available

## Advertisement

### PUBLIC HEALTH PHYSICIANS WANTED—

(a) City physician; state capital; \$300; South. (b) District health physician for rural community; \$250-\$325; public health training not required. (c) Epidemiologist for appointment in large eastern city; physician with experience as medical administrator in health department preferred; \$3,800-\$4,800. (d) Staff appointment with social hygiene clinic; physician with some general training in public health required; around \$3,300; Midwest. (e) Commissioner of maternal and child health; public health or obstetrical experience required; \$4,320. (f) Physician with teaching experience, ability as organizer and public speaker, for unusual appointment; considerable travel involved. (g) Venereal disease clinician; responsibility will include supervision of several small venereal disease clinics; annual income (including travel allowance) around \$4,200; Southwest. (h) Assistant health commissioner; city health department; around \$2,700; Ohio. (i) Physician with minimum year's training in obstetrics for special training course in public health obstetrics; some credit will be given toward American Board; \$150, plus travel allowance. (j) Woman physician with outstanding ability as public speaker for appointment as lecturer in state-wide cancer control program; \$200, generous expense allowance; car furnished. PH2-1, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

**PUBLIC HEALTH NURSES**—(a) Advisory nurse for department of maternal and child health; around \$195, plus travel allowance; degree, public health certificate, postgraduate work obstetrics or

pediatrics required. (b) Educational director; mid-western state health department; teaching background and supervisory experience, plus public health certificate required; \$2,400. (c) Educational director for field training center, state health department; degree, public health certificate required; South. (d) Public health nurse with minimum year's experience for county health appointment; \$140-\$150, travel allowance; Far West. PH2-3, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

**SANITARIANS**—(a) Sanitary engineer; county health department; about \$2,500, including travelling expenses; Midwest. (b) Chief sanitarian; district health department serving population of 5,000; degree, postgraduate work in public health required; 3-5 years' field experience desirable; \$2,400, plus travel allowance. PH2-4, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

**BACTERIOLOGIST**—Preferably one with M.D. or Ph.D. degree; department of pathology and bacteriology, university medical school; both teaching and hospital experience essential. PH2-5, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

**NUTRITIONAL CHEMIST**—Department of biochemistry, university medical school; training or experience beyond Bachelor's degree required; transfer later to board of health laboratory. PH2-6, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

# Situations Wanted

## Advertisement

**PUBLIC HEALTH PHYSICIAN**—B.S., M.D. degrees, eastern schools; C.P.H., Johns Hopkins; 4 years, health commissioner, midwestern city of 60,000; 3 years, head department of health and physical education, state university; 4 years, assistant commissioner, state health department. PH2-7, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

**PUBLIC HEALTH NURSE**—B.S. and Diploma in Nursing, M.S. in Social Administration, Western Reserve University; several years' experience as instructor; 8 years, supervisor, public health unit

consisting of five counties. PH2-8, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

**BACTERIOLOGIST**—B.S., M.D., D.Sc. degrees, with majors in bacteriology; certificate in public health, eastern university; several years' teaching experience, including professorship in bacteriology and pathology; able lecturer; now interested in public health appointment. PH2-9, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.



# NEWS FROM THE FIELD

## TOLAN COMMITTEE HEARING ON PUBLIC HEALTH

A HEARING before the Tolan Committee of the House of Representatives (Select Committee Investigating National Defense Migration) was held in Washington on January 15. The panel of persons engaged in public health who were invited to appear included Reginald M. Atwater, M.D., Executive Secretary, American Public Health Association, New York, N. Y. (Moderator); Martha M. Eliot, M.D., Associate Chief, Children's Bureau, Washington, D. C.; Alma Haupt, R.N., Nursing Consultant, Health and Medical Committee, Federal Security Agency, Washington, D. C.; George H. Ramsey, M.D., Commissioner of Health, Westchester County, N. Y.; James G. Townsend, M.D., Director Industrial Hygiene Division, National Institute of Health, Washington, D. C.; Huntington Williams, M.D., Commissioner of Health, Baltimore; Abel Wolman, Dr. Eng., Professor of Sanitary Engineering, Johns Hopkins University, Baltimore.

In presenting the panel, Dr. Atwater quoted a high British official who recently had said that the greatly expanded social and health services in England did as much to win the Battle of Britain as the Royal Air Force. British experience shows that many people fear loss of security in health and economics even more than they fear death by bombing. The English people know that, no matter what happens to their homes as a result of air raids, they need not worry about their economic or health security. They are enabled to rebuild their homes through insurance provisions, they are able to feed, clothe, and shelter their families through the social services and give

them medical and health services as well. What is lost is lost by all; what is saved is saved for the use of all. On such a foundation morale is built.

The focus of this hearing relates to the part which health security can play in building and maintaining this morale in the present emergency. The members of this panel, representing as they do a variety of public health specialties, have a simple message for this committee on which they are entirely agreed.

1. We know what good health services are and we can supply a blueprint.

2. Even a perfect blueprint left on paper will not meet the need. It is necessary to implement this blueprint in order to build public morale.

In summary, the panel presented the following information:

### *Health Services in War Time*

Health officers and health department staffs are expected always to be on duty to fulfil urgent needs of civil government. Our present state of war calls for a clarification of aims, some simplification of organization, and a considerable strengthening of effort to develop and keep fit a nation of superior men, women, and children capable of an optimum life within the privileges and duties of free peoples.

The public health profession is already on record as to what should be the minimum functions and the organization principles for health activities. For the sake of the record there was submitted a statement of these principles unanimously adopted by the American Public Health Association at a recent meeting. (See *A.P.H.A. 1940-1941 Year Book*, pp. 43-50.)

Wherever these minimum functions now exist we believe that service must be maintained during the emergency. Wherever they do not exist we point out that our nation is vulnerable at that point and we believe these services must be established.

In order to build public morale it must be emphasized that in every area of the United States and its territorial possessions these functions need extension and improvement. We believe that it is vital here and now to translate those principles into militant action. These blueprints must be converted into practical programs for state, city, and county work, and the voluntary organizations must take an appropriate place with the official agencies.

The public health profession has a single aim and that is victory for the United Nations, and to this end we as a body of public servants dedicate all the resources of our professional and technical capacities.

Any neglect or curtailment of the essential protection of civilian health, whether at home or in the factory or other work place, is inconsistent with maximum efficiency of the military forces and the preservation of public morale.

We believe that the trained civil health worker is properly to be considered indispensable to the maintenance of national health. We believe that he should be encouraged to continue at his regular station in civil government unless it is clear that the war can be more effectively prosecuted by his transfer to military service.

In order to build sound public morale, those states and more limited areas now wholly or in large measure lacking the reality and in some instances even the form of responsible health services by trained and experienced health officers devoting their entire time to the public need, and to enforcing the reasonable and necessary provisions

of sanitary and public health law, should be with all speed provided with health officers competent to give leadership and direction, and authorized to spend public funds sufficient to make health services a reality for every unit of population and for every area of civil jurisdiction under the flag of the United States.

It should be recognized that a competent modern health department comprises a medical, sanitary and related biological and social service which enjoys broad authority to meet a wide variety of emergencies.

We believe that at present it is neither politically desirable nor legally practical to create a fully centralized health authority under the federal government. We believe, however, that ways must be found to help the health officer and each member of his staff to think of himself as conducting an essential portion of a national project for the people's health and as acting at all times as if he were in fact at the administrative disposition of the Surgeon General of the U. S. Public Health Service. We are glad to see that steps are being taken to expand the reserve of the Public Health Service, even though those who are commissioned may be expected to remain in their key positions unless their presence elsewhere is urgently demanded through enemy action or through the presence of epidemic disease.

We believe that, if the public will accept and act with vision and confidence upon the principles and policies here declared, victory in arms can be achieved without sacrifice of the continuing and progressive health needs of a people devoted to the humanities of peace.

This introduction was followed by specific testimony as to the means by which the technics of public health can be used to build public confidence and morale. Dr. Martha Eliot spoke of the

opportunity to use maternal and child health services. Miss Alma Haupt spoke on the use of public health nursing and other nursing services. Dr. George H. Ramsey and Dr. Huntington Williams spoke from the standpoint of local health officers. Dr. James G. Townsend spoke from the standpoint of industrial health and the contribution which can be made through the employment by factories of adequate staffs for the health protection of their personnel.

At the conclusion of this hearing the Right Honorable Malcolm Macdonald, High Commissioner for the British Empire to the Dominion of Canada, Ottawa, testified as to the usefulness of public health services in Great Britain during the present emergency. He emphasized the wide variety of responsibilities which were thrown upon health personnel and indicated how some health jurisdictions had undergone a change in their programs so that much more than half of the time was devoted to emergency services rather than to the conventional side of public health.

Complete testimony will become available with the report of the Tolan Committee, of which Representative John H. Tolan of California is Chairman.

DR. L. R. THOMPSON APPOINTED CHIEF  
INSPECTING OFFICER, U. S. PUBLIC  
HEALTH SERVICE

**D**R. LEWIS R. THOMPSON, Director of the National Institute of Health and Assistant Surgeon General in charge of Scientific Research, has been appointed Chief Inspecting Officer of the U. S. Public Health Service, a new position established in the Office of the Surgeon General.

In announcing Dr. Thompson's appointment, Surgeon General Thomas Parran stated that the personnel and activities of the Public Health Service have been greatly augmented during the past year to meet the demands of mili-

tary and civilian defense. As a result, it is important to consolidate, under one head, the field activities of the district offices of the Public Health Service and of its liaison officers in the army corps areas. In order to undertake these additional duties, Dr. Thompson is relinquishing his post at the Institute at his own request.

Dr. Thompson, who is a native of Indiana, was born in 1883, received his medical degree at Louisville Medical College in 1905, and entered the Public Health Service in 1910. During much of his career he was closely associated with the late Dr. Wade Hampton Frost in epidemiological studies. As a part of his duty Dr. Thompson has served in the Philippine Islands; he was the first Chief of the newly established office of Industrial Hygiene Investigation in 1921, and since 1930 has been Assistant Surgeon General in charge of the Division of Scientific Research.

While in charge of this division the separate offices of cancer research, child hygiene, goiter investigation, industrial hygiene, malaria investigations, milk investigations, nutritional research, sewage disposal, stream pollution, undulant fever, and statistical studies have come under his supervision, as well as the National Institute of Health. During his administration the National Institute of Health was reorganized into eight divisions and there has been initiated a federally supported cancer research program and the National Cancer Institute. The Division of Chemotherapy was added to the Institute in 1940. During this period also the headquarters of the Institute were transferred to a group of new buildings at Bethesda, Md.

DR. ROLLO E. DYER APPOINTED DIRECTOR  
OF NATIONAL INSTITUTE OF HEALTH

**E**FFECTIVE February 1, 1942, as announced by Dr. Thomas Parran, Surgeon General of the U. S. Public Health Service, Dr. Rollo E. Dyer,

Assistant Director of the Institute, has been appointed Assistant Surgeon General in charge of the Division of Scientific Research of the Public Health Service and as Director of the National Institute of Health, succeeding Dr. Lewis R. Thompson who has been appointed Chief Inspecting Officer of the U. S. Public Health Service.

Dr. Dyer, who is a native of Ohio, was born in 1886. He is a graduate in medicine from the University of Texas in 1915 and, following his internship, he was commissioned in the Public Health Service.

Since 1921 Dr. Dyer has been detailed to the National Institute of Health (formerly the Hygienic Laboratory) and he has been closely identified with the late Dr. Joseph Goldberger and Dr. George W. McCoy. Since 1937 he has been Chief of the Division of Infectious Diseases at the Institute. In addition to studies on streptococcal infections, especially scarlet fever, he has made contributions to the knowledge of the rickettsial infections, notably typhus fever. He first identified the virus of typhus fever in rat fleas taken from houses where cases of endemic typhus were occurring, thus demonstrating that the body louse is not the only insect vector of typhus infection.

for the development of a broad program of public health training.

The difficulties which the Institute faces in financing and developing public health work do not apply in the development of biophysics, biochemistry, and biotechnology. This work is already expanding under the leadership of Dr. Francis O. Schmitt with the help of a \$200,000 grant from the Rockefeller Foundation and a special grant of \$70,000 from the same source to set up an electron microscope center. Beginning next July this program and the work in food technology will be administered as a Department of Biology and Biological Engineering.

The present program in public health and public health engineering will continue for 2 years as a separate Department of Public Health, but only such undergraduate and graduate students will be admitted as may reasonably be expected to qualify for a degree within that period. Subsequently the Institute will offer public health subjects only in public health engineering, in food technology, and as electives. Dr. Clair E. Turner, who retires as Professor Emeritus in 1944 after thirty years of service at M. I. T., has been appointed to head the separate Department of Public Health, beginning July 1.

#### CHANGES IN PUBLIC HEALTH COURSES AT MASSACHUSETTS INSTITUTE OF TECHNOLOGY

THE Massachusetts Institute of Technology has announced a change in its program of professional training in public health to become effective June 30, 1944. After that time the public health program will be restricted to the training of public health engineers and food technologists. This change recognizes the increased importance of the medical and social sciences in the training of many types of public health workers, which makes the university better adapted than a technical school

#### UNIVERSITY OF MINNESOTA FELLOW- SHIPS 1942-1943

THE University of Minnesota has announced a number of in-service fellowships in Public Administration for the academic year 1942-1943. The period of training for in-service fellows will extend through the fall, winter, and spring quarters and for the first term of the summer session. Individual courses of study will be planned for each student, depending upon previous preparation, personal interests, and the requirements of public service. These in-service fellowships will carry stipends varying in amount from \$1,000

to \$1,500 a year, depending upon the student's experience, his present salary, and the number of his dependents.

Applicants for these fellowships must be citizens of the United States, not over 35 years of age, graduates of recognized universities and colleges, and must qualify for admission to the Graduate School of the University of Minnesota. They must have had not less than 3 years of experience in public service, preferably in a position involving some administrative responsibility. Each applicant must be endorsed by his governmental employer, and he should secure promise of a leave of absence for the duration of his fellowship year.

Applications must be submitted not later than April 1, 1942. Appointments will be announced May 15 or as soon thereafter as possible. Requests for application blanks and for further information should be addressed to the Secretary of the Committee on Training for Public Administration, 13 University Library, University of Minnesota, Minneapolis, Minn.

#### ADVISORY BOARD ON SANITARY AND PUBLIC HEALTH ENGINEERING

THE Office of Civilian Defense, Washington, D. C., has announced that the members of the National Technological Civil Protection Committee, appointed by the Secretary of War in January, 1941, have agreed to act also as an Advisory Board on Sanitary and Public Health Engineering to the Medical Division of the Office of Civilian Defense. The committee, representative of engineering and related societies, includes:

- Walter D. Binger, New York, N. Y., American Society of Civil Engineers, Chairman
- W. H. Carrier, Syracuse, N. Y., American Society of Heating and Ventilating Engineers
- Frederick G. Frost, New York, N. Y., American Institute of Architects
- E. M. Hastings, Richmond, Va., American Railway Engineering Association

- Harry E. Jordan, New York, N. Y., American Water Works Association
- W. Cullen Morris, New York, N. Y., American Gas Association
- John C. Parker, New York, N. Y., American Institute of Electrical Engineers
- Arthur B. Ray, New York, N. Y., American Institute of Chemical Engineers
- Scott Turner, New York, N. Y., American Institute of Mining and Metallurgical Engineers
- James L. Walsh, New York, N. Y., American Society of Mechanical Engineers
- Abel Wolman, Baltimore, Md., American Public Health Association

The Office of Civilian Defense will have a contact member on this committee as does the War Department. Ralph E. Tarbett, Senior Sanitary Engineer, U. S. Public Health Service, who has been assigned as Chief Sanitary Engineer of the Medical Division of the Office of Civilian Defense with headquarters in the Washington office, will be the contact member for the Office of Civilian Defense.

Regional Sanitary Engineers are being appointed by the Medical Division of the Office of Civilian Defense to work through state defense councils with state health departments in planning defense against belligerent action. Most important of their immediate duties will be to promote development of protective measures for public water supplies, which may be subject to destructive enemy action. The engineers will also consult with health authorities on such matters as emergency maintenance of sewerage, sanitary facilities, garbage disposal, protection of food and milk supplies in the event of a disaster.

Two regional sanitary engineers are already on duty. Gordon E. McCallum, sanitary engineer, U. S. Public Health Service, has been commissioned in the Public Health Service Reserve and assigned to the Third Civilian Defense Region (Pennsylvania, Maryland, District of Columbia and Virginia) plus West Virginia and Ohio. Mr. McCallum is stationed in Washington.

John H. Brewster, at various times sanitary engineer for the American Waterworks and Electric Company and for the New York and Indiana State Health Departments; and recently a private consultant in Troy, N. Y., has also been appointed a sanitary engineer in the Reserve of the Public Health Service and assigned to the First and Second Regions (New York, New Jersey, Delaware and the New England States).

#### NEW RADIO HEALTH CAMPAIGN

THE Federal Security Agency, the U. S. Public Health Service, and the U. S. Department of Agriculture are coöperating with the Women's National Emergency Committee and the National Broadcasting Company in presenting the new winter series of "Listen America," the coast to coast radio campaign for better national health, which opened on November 23. Included on the premier program was Dr. William Henry Sebrell, Jr., of the Federal Security Agency, Washington, D. C.

#### NEW YORK STATE DEPARTMENT OF HEALTH

AMONG recent changes in the staff of the New York State Department of Health are the following:

Thomas D. Dublin, M.D., Dr.P.H., has been appointed Epidemiologist in the Division of Communicable Diseases.

Robert F. Korn, M.D., Dr.P.H., has been transferred from the position of Assistant District Health Officer in the Amsterdam District and has been appointed Epidemiologist in the Division of Communicable Diseases.

The following have been appointed Assistant District Health Officers and are assigned to the Districts indicated:

Theodore S. Drachman, M.D., New York, N. Y.

Earle H. Harris, M.D., M.P.H., Geneva

Berwyn F. Mattison, M.D., Albany office

Terry S. Montague, Gouverneur  
Louis Platt, M.D., M.S.P.H., Middletown  
Arthur M. Rubin, M.D., Buffalo  
Edward R. Schlesinger, M.D., Syracuse

#### NEW JERSEY HEALTH AND SANITARY ASSOCIATION

THE following officers were elected at the Annual Meeting of the New Jersey Health and Sanitary Association on December 5, 1941:

*President:* H. F. Kilander, Ph.D., Glen Ridge  
*First Vice-President:* Joseph H. Kler, M.D., New Brunswick

*Second Vice-President:* M. Warren Cowles, New Milford

*Third Vice-President:* C. Byron Blaisdell, M.D., Long Branch.

Dr. John L. Rice, who spoke at the annual meeting luncheon, delivered a paper on "Changing Trends in Public Health."

#### HEALTH IN HOME AND NATIONAL DEFENSE

THE theme of a conference sponsored by the Florida State-wide Public Health Committee in Orlando, Fla., on January 16-17, 1942, was "Health in Home and National Defense."

The guests of honor were: Thomas Parran, M.D., Surgeon General of the U. S. Public Health Service, and Mrs. Spessard L. Holland, wife of the Governor of Florida. There were many speakers from outside the state including: Carl E. Buck, Dr.P.H., and Benjamin G. Horning, M.D., Field Director and Associate Field Director respectively of the American Public Health Association; James A. Crabtree, M.D., Executive Secretary, Health and Medical Committee, Federal Security Agency; John A. Ferrell, M.D., Associate Director, International Health Division, Rockefeller Foundation; Ruth O. Blakeslee, Merit System Consultant, U. S. Children's Bureau; and, Harry E. Handley, M.D., Assistant Director, Division of Public Health, The Commonwealth Fund.

## PERSONALS

## Central States

JOHN A. CARSWELL, M.D., D.P.H.,<sup>†</sup> who has been employed with the Wisconsin Anti-Tuberculosis Association, Milwaukee, has been appointed Deputy Commissioner and Director of the Division of Maternal and Child Health of the Peoria, Ill., Department of Health, effective February 1. He will be associated there with S. M. MILLER, M.D.,<sup>†</sup> Commissioner of Health, replacing JOSEPH H. KINNAMAN, M.D., M.P.H.,\* who has become Health Officer of New Rochelle, N. Y.

HARLEY F. FLANNIGAN, M.D., Lagrange, Ind., has been named Health Commissioner of Lagrange County, succeeding DR. FRANK MORSE NICHOLS, Topeka, resigned.

GEORGE F. FORSTER, M.D.,<sup>†</sup> Assistant Chief of the Division of Laboratories in the Illinois Department of Public Health, Chicago, has been appointed Associate Professor of Bacteriology in Loyola University School of Medicine.

BRUNO GEBHARD, M.D.,\* Director of the Cleveland Museum of Health and Hygiene, has been invited by DR. ANGEL DE LA GARZA BRITO, Dean of the School of Public Health and Hygiene, Mexico, to visit Mexico City to confer with local authorities on the establishment of a health museum.

CLIFFORD H. GREVE,<sup>†</sup> Statistician of the Division of Venereal Disease with the Michigan Department of Health, has been granted a leave of absence. He has been called to active duty as a First Lieutenant, Medical Administrative Corps, United States Army, and is stationed at Michigan Selective Service Headquarters, Lansing, Mich. The Governor of Illinois recently appointed the following to the Board of

Public Health Advisers in the State Department of Health: DRs. WALTER D. STEVENSON of Quincy, RAYMOND W. MCNEALY, JAMES H. HUTTON and ROBERT S. BERGHOFF, Chairman, all of Chicago. DR. CLIFFORD U. COLLINS, Peoria, was reappointed to the board, which serves in an advisory capacity to the State Director of Public Health.

## Eastern States

PETER F. HARRINGTON, M.D., Providence, R. I., has been appointed Director of a new Division of Tuberculosis Control in the Providence Health Department.

## Southern States

MIRIAM E. BRAILEY, M.D.,<sup>†</sup> Associate in Epidemiology, Johns Hopkins University School of Hygiene and Public Health, Baltimore, Md., has been appointed Director of the Bureau of Tuberculosis of the City Health Department.

CHESTER A. HICKS, M.D.,<sup>†</sup> Cochran, Tenn., formerly with the Georgia State Department of Health, has been placed in charge of Carter-Union-Johnson Counties Health Unit, Elizabethton.

CARL A. NAU, M.D.,\* formerly Director of the Texas Division of Industrial Hygiene, is now Professor of Physiology and Preventive Medicine and head of the Department, University of Texas School of Medicine, Galveston.

ARDZROONY PACKCHANIAN, M.D.,<sup>†</sup> who has been with the National Institute of Health, U. S. Public Health Service, Washington, D. C., has accepted Associate Professorship in Bacteriology and Tropical Medicine, Department of Preventive Medicine and Public Health, Medical School, University of Texas, Galveston.

DERRIC C. PARMENTER, M.D., Tupelo, Miss., has succeeded DR. THOMAS L.

\* Fellow A.P.H.A.

<sup>†</sup> Member A.P.H.A.

HARVEY as Head of the Dyer County Health Department, Dyersburg, Tenn. WILLIAM L. PHILLIPS, M.D., Centerville, Tenn., Director of the Hickman County Health Department, has been named Registrar of Vital Statistics for the County.

RAYMOND H. RUND, M.D., Mount Vernon, Mo., has been named Medical Director and Superintendent of the Peoria, Ill., County Tuberculosis Sanatorium District, with offices in Peoria, succeeding DR. DAVID F. LOEWEN,† Decatur, Ill. Dr. Loewen will occupy a similar position at the Macon County Tuberculosis Sanatorium District.

### Western States

THEODORE G. LATHROP, M.D., of White Salmon, Wash., has been appointed Acting Health Officer of Klickitat County.

RAYMOND MEL PERRY, M.D.,† Pasco, Wash., was recently appointed Director of the Sevier County Department of Health, Tenn., succeeding DR. LAMAR A. BYERS, Sevierville, who is studying at Johns Hopkins University.

### DEATH

LLOYD HENRY SARCHET, M.D., of Wellington, Kan., City and County Health Officer, died on November 14.

† Member A.P.H.A.

## CONFERENCES AND DATES

American Academy of Pediatrics—Region I. Hotel Bellevue-Stratford, Philadelphia, Pa. April 1-3.

American Academy of Political & Social Science. Philadelphia, Pa. April 10-11.

American Association for Social Security. New York, N. Y. April 10-11.

American Association of Anatomists. Hotel Commodore, New York, N. Y. April 1-3.

American Association of Industrial Physicians and Surgeons. Gibson Hotel, Cincinnati, Ohio. April 13-17.

American Association of Orthodontists. New Orleans, La. March 16-19.

American Association of School Administrators. San Francisco, Calif. February 21-26.  
American Association of Social Workers—Delegate Conference. New Orleans, La. May.

American College of Physicians. Public Auditorium. St. Paul, Minn. April 20-24.

American Congress on Obstetrics and Gynecology. Municipal Auditorium, St. Louis, Mo. April 6-10.

American Home Economics Association. Boston, Mass. June 21-25.

American Library Association. Milwaukee, Wis. June 22-28.

American Medical Association. Convention Hall, Atlantic City, N. J. June 8-12.

American Orthopsychiatric Association—Nineteenth Annual Meeting. Hotel Statler, Detroit, Mich. February 19-21.

American Psychiatric Association. Hotel Statler, Boston, Mass. May 18-22.

American Public Health Association—71st Annual Meeting. Headquarters, Municipal Auditorium, St. Louis, Mo. October 27-30.

American Society of Civil Engineers—Spring Meeting, New Orleans, La. April. Summer Meeting, Spokane, Wash. July.

American Society of Planning Officials—Joint Conference with National Conference on Planning. Indianapolis, Ind. May 24-28 (tentative).

American Water Works Association—Indiana Section—Purdue Memorial Building, Lafayette, Ind. April 9-10.

Canadian Section—General Brock Hotel, Niagara Falls, Ontario, Canada, April 15-17.

Southeastern Section. Savannah, Ga. April 20-22.

New York Section. Niagara Falls, N. Y. April 30-May 1.

Pacific Northwest Section—Marcus Whitman Hotel, Walla Walla, Wash. May 7-9.

Ohio Section. Toledo, Ohio. May 15-16.

Annual Convention—The Stevens Hotel, Chicago, Ill. June 21-25.

Institute of Food Technologists. Minneapolis, Minn. June 15-17.

National Association of County Officials. Hollywood, Calif. May 20-23.

National Association of Housing Officials. Los Angeles, Calif. June 10-13.

National Conference of Social Work. New Orleans, La. May 10-16.

National Council of State and Local Public Welfare Administrators. May.

National Education Association. Denver, Colo. June 28-July 2.

National Gastroenterological Association. Biltmore Hotel, New York, N. Y. June 3-6.



National Institute of Social Sciences. New York, N. Y. February 6.

National Organization for Public Health Nursing. Biennial Convention. Palmer House, Stevens Hotel and The Coliseum, Chicago, Ill. May 18-22.

New England Public Health Institute. Providence, R. I. April 21-23.

National Tuberculosis Association—38th Annual Meeting, held jointly with American Trudeau Society—37th Annual Meeting, and National Conference of Tuberculosis Secretaries—20th Annual Meeting, Hotel Bellevue-Stratford, Philadelphia, Pa. May 6-9.

Smoke Prevention Association. Cleveland, Ohio. May 17-20.

Special Libraries Association. Los Angeles, Calif. June 2-6

#### Canada

Canadian Federation of Mayors and Municipalities, Ottawa, Ontario. Probably April.

Canadian Medical Association. Jasper Park Lodge. Jasper Park, Alberta, Sask. June 15-19.

Canadian Public Health Association. Royal York Hotel, Toronto, Ont. June.

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# American Journal of Public Health and THE NATION'S HEALTH

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## Occurrence and Recovery of the Virus of Infantile Paralysis from Sewage<sup>\*</sup>

JOHN R. PAUL, M.D., AND JAMES D. TRASK, M.D.

*Section of Preventive Medicine, and Department of Pediatrics, Yale University  
School of Medicine, New Haven, Conn.*

THE discovery that the virus of poliomyelitis could be found in human feces was made in Sweden about thirty years ago,<sup>1</sup> and corroborated in the United States a few years later,<sup>2</sup> but interest in these findings soon waned because for a long time no one repeated the discovery. About four years ago, however, this fact, namely the presence of virus in human stools, was "rediscovered," and it soon became evident that in young patients recently convalescent from poliomyelitis it is easier (perhaps much easier) to demonstrate the virus in the stool than in the nose or throat. One reason for this is, that after an attack of the acute disease the virus remains in the intestinal tract for longer periods of time than in the throat. In stools it has been repeatedly found, in the second or third week of convalescence from a severe or mild attack of the disease.<sup>3</sup> In one series of cases it was demonstrated in almost 70 per cent of the cases tested.<sup>4</sup> Occa-

sionally the virus may persist in the stools for months, as was noted in a report from Paris where the virus was isolated from the stool of a child who had sustained a mild attack of the disease 123 days prior to the time when the test was made.<sup>5</sup>

These findings tend, whether rightly or wrongly, to place poliomyelitis in the category of so-called intestinal diseases, which include typhoid fever and dysentery. We are not on the firmest of ground in classifying poliomyelitis this way, for we do not know whether the presence of the virus in the stools of patients is a direct or even an indirect link in the chain which actually leads this agent from one patient to another. But from the epidemiological standpoint, from the engineering standpoint, and from the public health standpoint, the intestinal tract seems like a dangerous place for this virus to be. During epidemics, the dissemination of poliomyelitis virus throughout the community is great, particularly when one considers how much virus may be present in a single human stool (for somewhere between 1,000 and 10,000 doses infective for the monkey have been demon-

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<sup>\*</sup> Read before the New Jersey Section of the American Water Works Association and the Engineering Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 16, 1941.

strated in a 50 gm. stool). Most of this dissemination occurs through carriers, which are usually unrecognized. Although in the more severe urban epidemics, the case rate is seldom greater than 1 per 1,000, this usually refers to the paralytic and frank cases. The more common, abortive cases harbor the virus as well if not better than the paralytic cases. They outnumber the paralytic cases by many times<sup>6</sup> and, as they are generally undiagnosed, they actually are the equivalent of transient healthy carriers. It is readily seen then how great a quantity of virus must enter urban sewers during epidemic times, and it becomes important to know something of the conditions under which it survives in this medium.

Before describing experiences with sewage, however, it is worth mentioning the fact that poliomyelitis virus is quite stable and more resistant to chemicals than certain bacteria such as *Escherichia coli*. This virus survives well in 15 per cent ether and in low dilutions of phenol. In suspensions of human feces it keeps at icebox temperature for months.<sup>7</sup> In sterile water, preserved in the light at room temperature, the virus has been found active after 31 days<sup>8</sup> and in the dark for 114 days.<sup>9</sup> In milk the virus has been found active after 25 days<sup>8</sup>; and at icebox temperatures after 180 days.<sup>10</sup> In butter it has survived at  $-2^{\circ}\text{C}$ . as long as 91 days.<sup>11</sup>

Poliomyelitis virus is killed by the same degree of heat which kills most bacteria, in other words, exposures of  $45^{\circ}$  to  $50^{\circ}\text{C}$ . for 30 minutes are sufficient to inactivate the virus.<sup>12</sup> Ultra-violet light is also known to be injurious to the virus *in vitro*, exposure for short periods such as 5 seconds may noticeably weaken the virus, and longer exposures inactivate it.<sup>13</sup>

A practical question in this connection is one which concerns the resistance of the virus to chlorine. This has proved to be a difficult problem to

answer, and none of the experiments as yet reported in the literature lend themselves to ready interpretation or practical application. In our own laboratory we have been carrying on experiments with the assistance of the Chemical Division of the Wallace and Tiernan Company of Newark, N. J. We have used suspensions of virus from infected spinal cord (which has been the technic employed by most other workers in this field), and also suspensions of virus as it naturally occurs in the human stool from patients convalescent from the human disease. The work is not completed and the results have been somewhat irregular.

From the literature we find that Levaditi, Kling, and Lépine, in 1931,<sup>14</sup> found that 4 p.p.m. of  $\text{Cl}_2$  was capable of rendering artificially contaminated, slightly turbid water non-infectious after 24 hours; while 0.4 p.p.m. was effective in clear preparations. Kempf and Soule, in 1940,<sup>15</sup> reinvestigated this problem employing a 1:1,650 suspension of (M.V.) virus in water to which varying amounts of  $\text{Cl}_2$  had been added and found that 0.5 p.p.m., which is in excess of that usually employed in municipal water treatment, did not inactivate the virus of poliomyelitis in  $1\frac{1}{2}$  hours, but did so in 4 hours. The same investigators together with Pierce, in 1941,<sup>16</sup> next studied the effect upon the virus of sodium and calcium hypochlorite in tap water which gave a resulting  $\text{Cl}_2$  concentration of 1.0 p.p.m. This failed to inactivate poliomyelitis virus after 4 hours' exposure, at the end of which time the  $\text{Cl}_2$ , however, had fallen to 0.2 p.p.m. A concentration of 1.5 p.p.m. of  $\text{Cl}_2$  in tap water inactivated the virus in 20 minutes and a concentration of 0.55 p.p.m. inactivated it after 1 hour. It may be noted that the latter amount is equivalent or even in excess of that often employed in swimming pools.

So much for laboratory experiments.

The next question concerns the actual circumstances under which the virus of poliomyelitis has been demonstrated in water, or more accurately in sewage. To date there are seven tests in which this has been successfully accomplished in urban or hospital sewage during epidemic times. They include one positive test made in Charleston, S. C.,<sup>17</sup> three from a hospital sewer in Detroit,<sup>17</sup> one from Stockholm, Sweden,<sup>18</sup> and two from New York City.<sup>19</sup> Most of the positive tests have been obtained in the vicinity of hospitals, which is not surprising when one considers how resistant poliomyelitis is, and how much virus poliomyelitis patients may discharge. From the sewage studies it appears that the virus may still be detected when considerable dilution has taken place,<sup>17</sup> and we find that it may be transported by sewage for at least an eighth of a mile,<sup>17</sup> and perhaps for several miles.<sup>19</sup> Such findings raise the question, of course, as to whether or not poliomyelitis virus may not be a normal inhabitant of sewage, like tetanus bacilli or tubercle bacilli, for the mere presence of such organisms in sewage would tell us little about the epidemiology of the human infections which these bacteria cause.

It is desirable to know, therefore,

whether or not poliomyelitis virus may not be present all the time in urban sewage—that is, winter and summer, in good years and bad. If it were present at all times, such a finding would be in keeping with one theory of the pathogenesis of this disease, namely, that we are constantly exposed to the virus, winter and summer, year in year out, and only when profound alterations occur among the local population does the clinical disease come to the surface. To answer this question, a series of 22 tests on 11 post-epidemic sewage samples has been made in four large cities.<sup>17</sup> All of them were negative. We have also made a series of 87 tests on sewage during inter-epidemic periods both in winter and summer.<sup>19</sup> Samples tested represented hospital sewers and main sewers in the City of New Haven; and one of the larger collecting sewers in New York City, namely the Manhattan Grit Chamber indicated in Figure 1. From all these tests which have been carried on monthly for almost two years now, two positive results have thus far been obtained from New York City in September, 1940, and October, 1941. These were not years of large epidemics in New York City but the first positive test was encountered in the local sewer in the month (September, 1940)

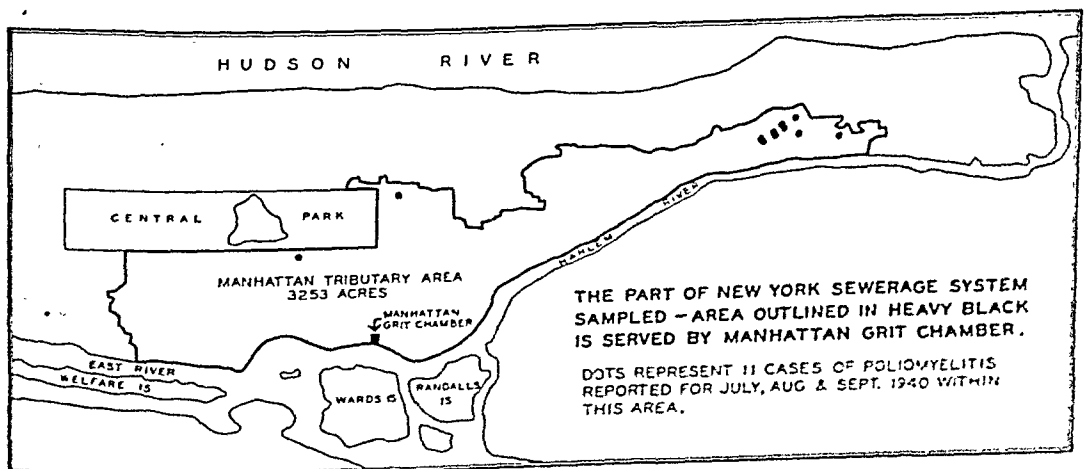


FIGURE 1—An outline map which includes the northern part of Manhattan Island and indicates the geographical relationships of poliomyelitis cases to the site (Manhattan Grit Chamber) where poliomyelitis virus was detected in September, 1940

when cases of poliomyelitis had reached a peak for the year in that city. In 1941 a positive test was obtained in October, following an increase in local cases during August, September, and October.

Regardless of the significance of this finding, the periodic testing of sewers as an index of local case prevalence of the human disease may eventually turn out to have some practical value. It is not clear as yet what its degree of practicality may be, for one does not always find the virus of poliomyelitis in urban sewage in epidemic times.\* Our methods for the detection of poliomyelitis are still crude, perhaps when they are improved the value of this technic can be judged in better fashion. So far, poliomyelitis virus has never been isolated from "river water" or from bathing beach water. A single questionable report from well water made in Sweden<sup>20</sup> would not fulfil the criteria which are demanded for a positive test in this country.

From circumstantial evidence, however, there has been reason to suspect certain polluted streams as occasionally being of significance from the standpoint of the spread of poliomyelitis. I refer to the suspicions of Caverly in Vermont in 1894, which he directed toward a polluted stream known as Otter Creek in Rutland County, Vt.,<sup>21</sup> and to the many observations made by Kling in Sweden where he developed his *theorie hydrique* which concerns the association of the disease with water courses.<sup>22, 23</sup> In this connection it is obvious that, during the summer, polluted water comes in contact with many living things and the question arises as to whether animals, birds, or insects may not act as intermediate hosts be-

tween the "reservoir" of the virus and man, such as is suspected in other summer virus diseases which attack the central nervous system in man, like equine encephalomyelitis of the Eastern and Western types, and St. Louis encephalitis.

A new finding which has only recently come to light and which may or may not have considerable significance in the epidemiology of poliomyelitis is the isolation of the virus of poliomyelitis from flies.<sup>24</sup> This has been done on two separate occasions in epidemics in Connecticut and Alabama. In both instances the "contaminated" flies were caught within areas where the prevalence of poliomyelitis was high and where proven human carriers were known to exist.\* In both instances the flies had had the opportunity of feeding recently, both in and outside of privies, on human stools which may well have contained the virus. The possible carriage of the virus by these insects would explain much about the baffling nature of this disease. It is undoubtedly a problem which deserves grave consideration by the sanitary engineer.

In conclusion, therefore, recent work (whether rightly or wrongly) has served to place poliomyelitis among the intestinal diseases rather than among the respiratory diseases. It has been suggested that principles of control may eventually turn out to be somewhat similar to those which have been employed with success in typhoid fever or dysentery. These measures do not seem justifiable at present, because of limited knowledge and because of certain differences between poliomyelitis virus and *Escherichia coli*. The differences are, that poliomyelitis virus is so much more stable, and more resistant to chemicals.

\* Even during epidemic times individual sewage tests may be negative. This we have encountered in tests made on sewage from Detroit and Frankenmuth, Mich.; Windsor, Canada; and Buffalo, N. Y., in 1939; Waterbury, Conn., in 1940; and in Miami and Pensacola, Fla.; Cleveland, Ohio; and Winnipeg, Manitoba, during 1941.

\* Since this paper was written two other reports have appeared by Sabin and Ward,<sup>25</sup> and Toomey,<sup>26</sup> which also describe the isolation of poliomyelitis virus from flies collected within epidemic areas.

Furthermore there is no assurance that the methods used successfully to purify and disinfect material contaminated with typhoid bacilli, for instance, would be successful with poliomyelitis virus. We are, as a matter of fact, quite in the dark as to the control of any virus disease which is also an intestinal disease. And in the control of poliomyelitis our ignorance remains profound. Among other things we still have to wait for more knowledge regarding the significance of insect vectors, and also regarding the existence (during epidemics) of other possible extra-human carriers of the virus, such as mammals or birds.

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# Opsonocytophagic Reaction to Whooping Cough Vaccination

With Particular Reference to the Effect of Age upon the Response\*

ALVIN E. KELLER, M.D., J. CYRIL PETERSON, M.D., AND  
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IN recent years efforts to find an immunizing agent against whooping cough have been intensified. The fact that approximately 60 per cent of the fatalities from whooping cough occur in infants less than one year of age makes it important that any vaccination procedure developed to control the disease be efficacious in the very young infant. It seemed desirable, therefore, to study the serological responses of children of various ages, particularly young infants, to pertussis vaccine prepared by the method of Sauer.

Such an investigation would have point only if it is assumed that the vaccination procedure is effective in conferring immunity. Soon after the organism now called *Hemophilus pertussis* was isolated from cases of whooping cough by Bordet and Gengou attempts at immunization against this disease were carried out. The earlier reports of such attempts seemed favorable, but subsequent reports were unfavorable. In 1925, however, Madsen<sup>1</sup> reported on the modification of whooping cough by the use of vaccines during an epidemic in the Faroe Islands. The report of Leslie and Gardner in 1931<sup>2</sup> on the

degeneration phases of *Hemophilus pertussis* when grown on artificial media suggested that the vaccine of Madsen owed its potency to the fact that it was prepared from recently isolated strains of the organism.

In 1933,<sup>3</sup> Sauer published the first of his reports on the use of large injections of a vaccine prepared from recently isolated strains of *Hemophilus pertussis* grown on a medium which retards degeneration. He was able to show that the vaccine conferred an apparent immunity. Subsequently, these studies have been confirmed by field trials with similar vaccines by Kendrick and Elderling,<sup>4</sup> Silverthorne,<sup>5</sup> Singer-Brooks,<sup>6</sup> Miller and Faber,<sup>7</sup> and others.<sup>8, 9, 10</sup> Doull and Shibley and their coworkers in a similar study were unable to show substantial protection against the infection or modification of the disease. They used a vaccine which differed from Sauer's in that the bacteria were washed once with distilled water.

Table 1 summarizes the results of some of the field studies on whooping cough vaccination. Variation in these results may be explained in part on the basis of the differences in the preparation of the vaccines and in the dosage used. This table suggests that large doses of a properly prepared *Hemophilus pertussis* vaccine may confer a certain

\* Read before the Epidemiology Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 14, 1941.

TABLE 1

Field Studies on Whooping Cough Vaccination

Year of Study	Author	No. Vaccinated Individuals	Number Exposed	Number of Cases	Primary Attack Rate	Secondary Attack Rate	Number Controls	Number Exposed	Number of Cases	Primary Attack Rate	Secondary Attack Rate
1938	Silverthorne	747	91	2	0.3	2.2	161	27	23	14.2	85.1
1938	Kendrick Elderling	1,851	311	52	2.8	16.8	2,397	434	348	14.5	80.2
1938	Singer-Brooks	272	42	7	2.6	16.6	256	71	62	24.2	87.2
1939	Sauer	2,453	..	32	1.3	....	1,730	..	286	16.5	....
1939	Doull, Shibley, et al.	342	?	54	15.8	....	385	?	70	18.2	....
1939	Miller-Faber	346	42	11	3.2	26.2	182	36	32	17.6	88.9

Modified from Miller, J. J., *California & West. Med.*, 53:25, 1940.

amount of immunity.<sup>†</sup> Acting on this assumption the serological responses of infants and older children following injection of pertussis vaccine were observed and compared to see whether there were any differences.

MATERIAL AND EXPERIMENTAL METHODS

The children selected for our investigation were patients attending the outpatient pediatric clinic of Vanderbilt University Hospital. They ranged in age from 6 weeks to 3 years and included 331 white and 50 negro children. Because of the small number of negro children no attempt has been made to study the two races separately. Selections were made on the basis of freedom from active disease processes and upon the desire and the ability of the mothers to coöperate. Most of the children were healthy infants who were being followed in the clinic for regulation of their diets and for routine immunizations.

The observations reported in this paper cover the period from October, 1938, to January, 1941. The children

have been divided into two groups, A and B. Group A consists of 293 children who received a course of vaccination in a 4 weeks' period, plus 44 children who had not completed their course of vaccination but who had adhered to the vaccination schedule up to their last observation. The total number of children in Group A, therefore, is 337. The age distribution of these children is as follows:

Age	Number of individuals
Less than 3 months	74
3- 5 months	89
6-12 months	79
Over 1 year	95
	<hr/> 337

Group B consists of 44 children who received the same total amount of vaccine as those in Group A, but the injections were irregularly spaced over a period ranging from 5 through 10 weeks. The age distribution of the children in Group B is essentially the same as that of the children in Group A.

As far as could be determined by careful questioning of the mothers, none of the children in either group had had whooping cough previously. The great majority had had no known exposure to

<sup>†</sup> Since preparation of this article Rambar, *et al.*,<sup>12</sup> have reported another study indicating that "there is a definite reduction in the incidence and severity of whooping cough following vaccination with phase I, *Hemophilus pertussis* vaccine."



whooping cough and care was taken in the clinic to isolate the children in the study group from known contacts of whooping cough cases. Excluded from the study group were all children who developed pertussis any time within 6 weeks after the initial injection.

There were 57 children who started but never completed the vaccination course. This failure to continue was very rarely due to objections to the vaccination, but was in the main the result of the inability of the mothers to bring the children back to the clinic and of general lack of coöperative spirit.

The routine vaccination procedure used was to give a series of five 1 ml. subcutaneous injections of a vaccine containing 20 billion organisms per ml. over a period of 4 weeks. The vaccine was prepared as authorized by Sauer.\* The five dose method of vaccination was chosen primarily to avoid injecting doses larger than 1 ml. No reactions either local or general were encountered which were of sufficient severity to warrant either delaying or discontinuing the injections except in the case of one child. This child had a convulsion during the febrile response which usually accompanied the first and second injections. Subsequently, the child was given smaller and finally full-sized doses without recurrence of the convulsions.

Previous studies by others have shown that specific complement-fixing, agglutinating, and opsonic antibodies appear in the blood of patients following whooping cough and after the injection of potent *Hemophilus pertussis* vaccine. Although it is generally conceded that these phenomena of serological activity may be the result of varying expressions of a single antibody, the precise relationship of this antibody to immunity is indefinite. In this study the opsonocytophagic test employed by Kendrick and her coworkers<sup>13</sup> was used as a measure of

the antibody response.† This test was chosen because of the ease with which it could be performed. Kendrick found that the tests are negative or weakly positive in normal individuals and that an attack of whooping cough or injections of whooping cough vaccine induces a rise in opsonins, and that the reaction has a satisfactory degree of specificity.

Stained films were prepared and 25 intact polymorphonuclear neutrophilic leucocytes were examined and classified according to the estimated number of bacteria per leucocyte. Those cells showing no phagocytosed bacteria were called negative and the cells containing bacteria were classified as follows: 1-5, 6-20, 21-40, 41-100. This gradation does not necessarily represent a proportionate increase in pertussis antibody, but is merely a convenient classification. The average number of bacteria per leucocyte was then determined for each test performed. A certain number of tests were found to be unsatisfactory. In most instances this was due to inadequate mixing of the citrate and the blood with resulting clot formation. In tests from some of the smaller infants it was difficult to find 25 satisfactory cells in a stained film. These unsatisfactory tests have been noted in the tabulations.

Plate I shows photomicrographs of leucocytes with varying degrees of phagocytosis.

The opsonocytophagic tests were usually performed before the first injection of vaccine, at the time of the fifth injection, and 2 weeks later. Scattered tests were made during the vaccination and afterward at varying weekly intervals when vaccinated children returned for various reasons.

#### RESULTS

Table 2 and Figure 1 show the opso-

\* The vaccine for this study was supplied by Dr. W. A. Jamieson of the Eli Lilly Research Laboratories.

† The antigen used for the opsonocytophagic tests was supplied by Dr. Pearl Kendrick of the Western Division, Michigan State Laboratories.

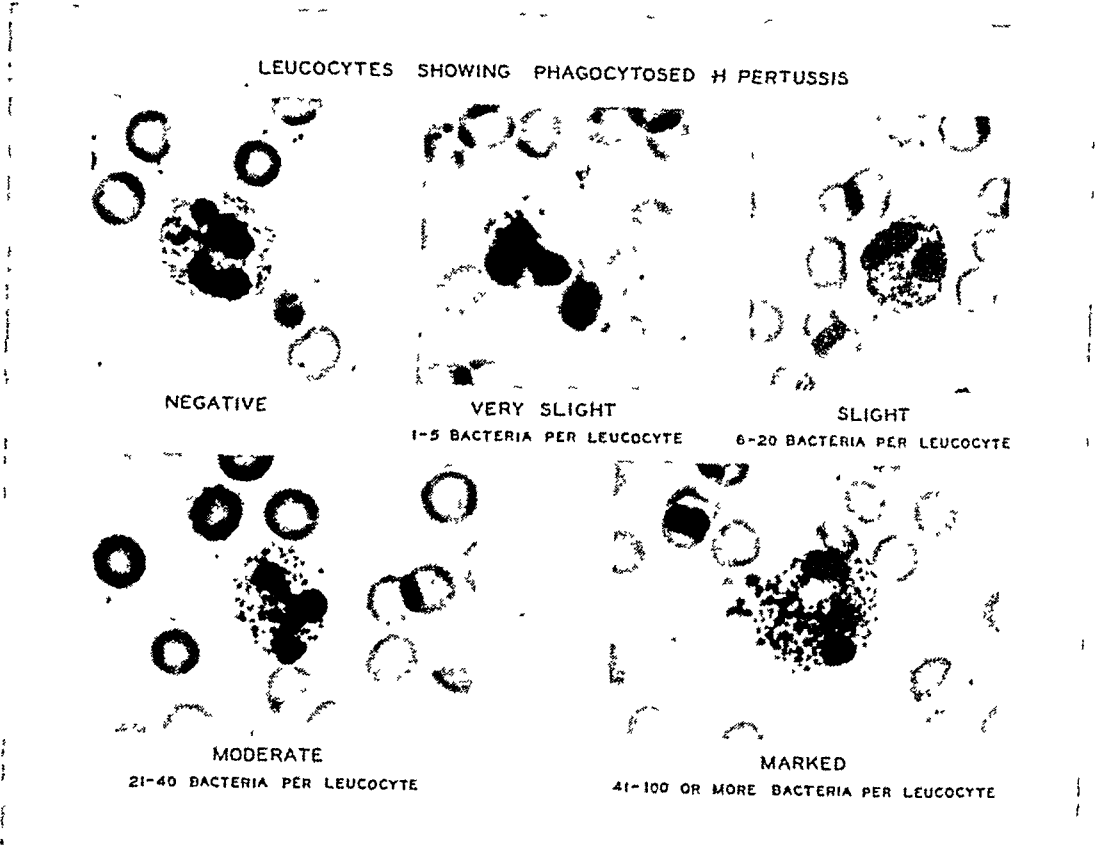


PLATE 1

nocytophagic response of the children of Group A as a whole. The table indicates the number of tests showing a given level of phagocytic activity expressed in terms of the average number of bacteria

per leucocyte according to the time in weeks following the first injection of vaccine. Figure 1 shows the opsonocytophagic response in terms of the percentage of tests showing any phagocytic

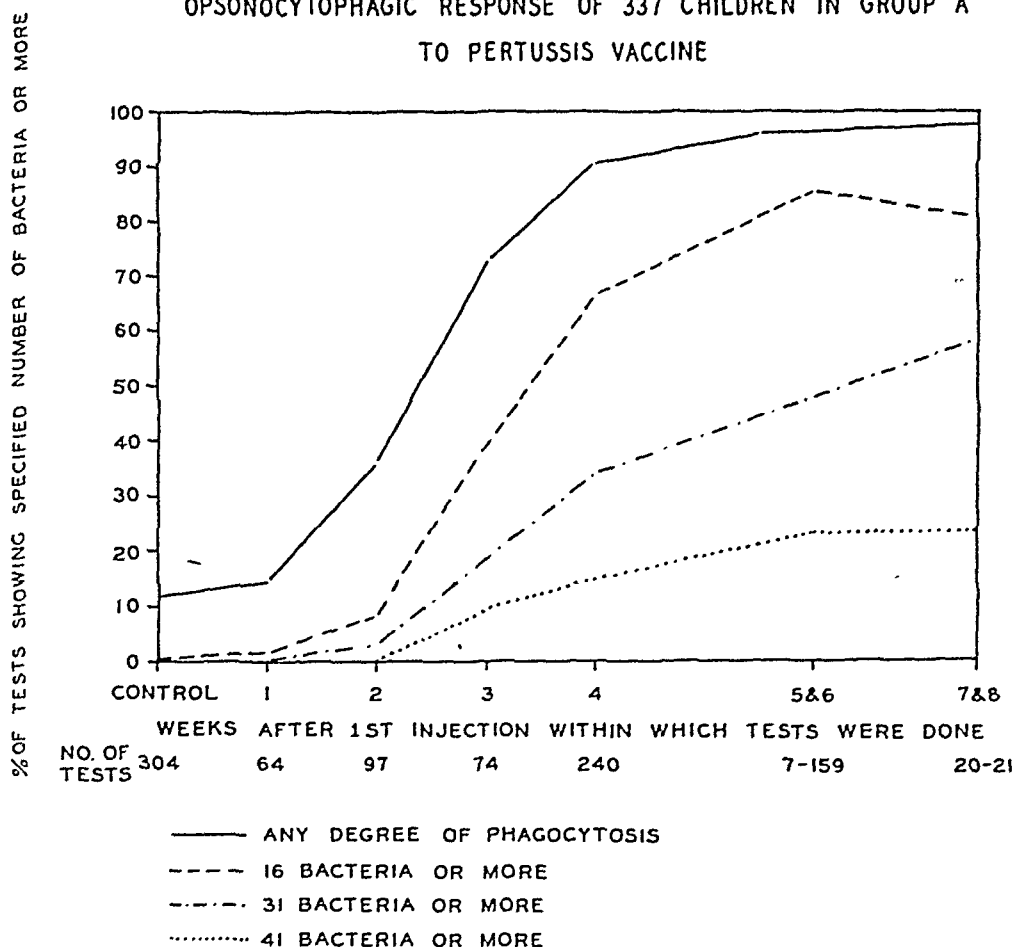
TABLE 2  
*Opsonocytophagic Response of 337 Children in Group A to Vaccination Against Whooping Cough*

Average Number of Bacteria per Leuco- cyte	First Test before First Injection	Number of Tests							Per cent of Tests Showing Specified Number of Bacteria or More						
		Weeks after First Injection							Weeks after First Injection						
		1	2	3	4	5-6	7-8		First Test	1	2	3	4	5-6	7-8
Negative	268	55	62	20	22	7	1	100 0	100 0	100 0	100 0	100 0	100 0	100 0	100 0
1-5	34	6	19	8	20	7		11 8	14 1	36.1	73.0	90 8	95.8	97.6	
6-10	1	2	4	8	21	4	2	0.7	4.7	16.5	62.2	85.2	91.6	97.0	
11-15			4	9	17	6	5	0 3	1 6	12 4	51.4	73 8	89 2	92 7	
16-20		1	4	5	27	13	4	0 3	1 6	8 3	39.2	66 7	85.5	80 5	
21-30	1		1	10	50	43	5	0.3	.....	4.1	32.4	55.4	74.7	70 7	
31-40			3	7	47	42	14			3.1	18.9	34 6	48 8	58.5	
41-50				3	26	26	6				9.5	15.0	23 5	24.1	
51-60				4	10	10	4				5.4	4 1	7 8	9 8	
61-70						3							1.8	.....	
Unsatisfactory or lost *	5	4	1	2	17	24	5								
Total	309	68	98	76	257	190	46								

\* Unsatisfactory or lost omitted from per cent computations

FIGURE 1

OPSONOCYTOPHAGIC RESPONSE OF 337 CHILDREN IN GROUP A  
TO PERTUSSIS VACCINE



activity, 16, 31, and 41 bacteria or more per leucocyte respectively.

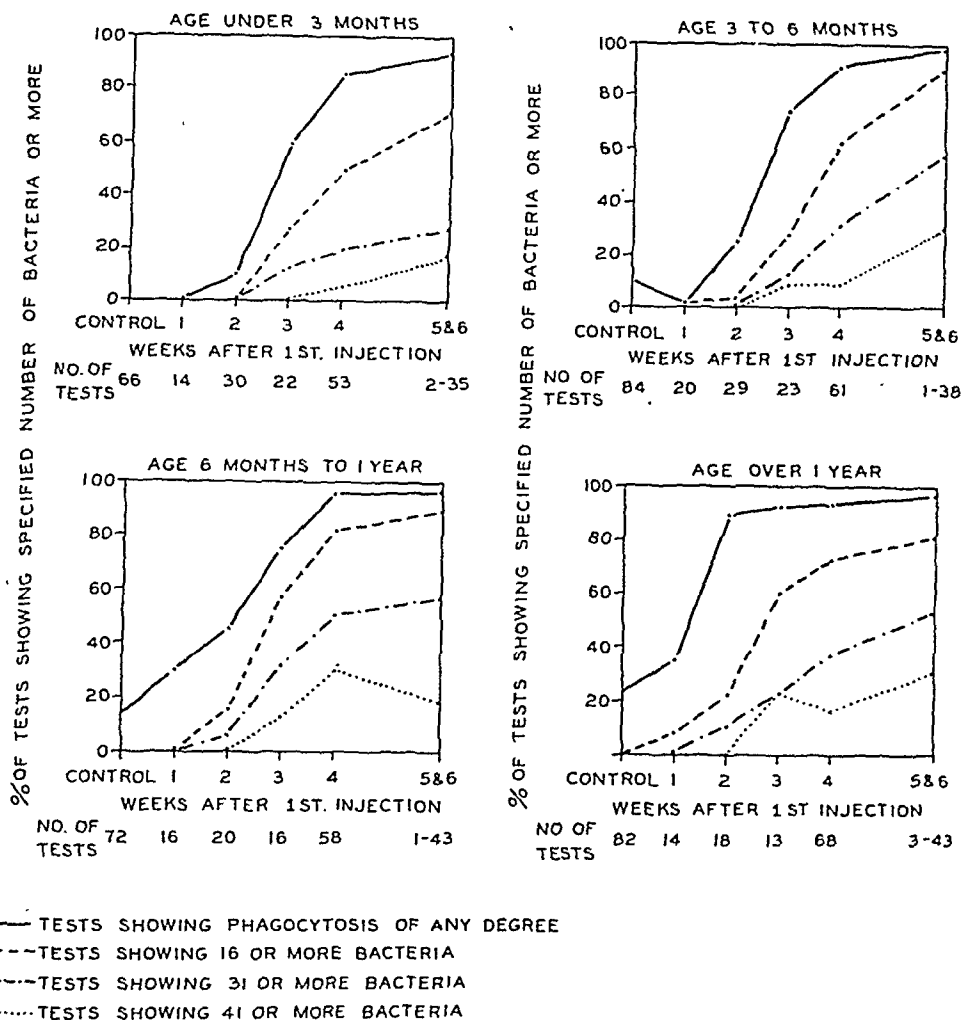
In the control tests for Group A, only 11.8 per cent of the individuals showed any phagocytic activity at all and in almost all of the instances where phagocytic activity was found the number of bacteria phagocytosed was less than 6 per leucocyte. Approximately the same degree of phagocytosis was found in tests run 1 week after the first injection. Two weeks following the first injection the per cent of tests showing phagocytosis rose to 36.1 and then rapidly to 95.8 per cent by the end of the 6th week following the first injection.

However, inasmuch as some control test may show phagocytic levels of 1-5 bacteria per leucocyte, phagocytosis of this degree in subsequent tests should not be considered significant, although

this phagocytic action may actually represent a response to the injections. On this basis, 91.6 per cent of the individuals 6 weeks after the first injection showed an increase in phagocytic activity. Of the individuals tested at this time 85.5 per cent showed levels of phagocytic activity of 16 bacteria or more, and almost half showed 31 bacteria or more. It is also seen that by the 7th and 8th weeks after the first injection (3 and 4 weeks after the completion of the course of injections) the curves of response have begun to level off. While the tests performed 3 or 4 weeks after the last injection are relatively few in number it seems probable that the maximum of the serological antibody response occurs somewhere in the neighborhood of 2 to 3 weeks following the last injection.

FIGURE 2

OPSONOCYTOPHAGIC RESPONSE OF CHILDREN IN GROUP A  
TO PERTUSSIS VACCINE ACCORDING TO AGE



Further examination of the data for Group A (Tables 3, 4, 5, and 6 and Figure 2) reveals progressive changes in the response to vaccination according to the age of the individuals tested. In the control tests of the age group less than 3 months no phagocytic activity was ever found, while in the control tests of the group 3 through 5 months of age, 8.3 per cent showed phagocytosis. This figure rose to 23.7 per cent in children older than 1 year. In only two instances, however, was the degree of phagocytosis on the control test greater than 5 bacteria per leucocyte. Both of

these instances occurred in children in the oldest age group, one of whom showed phagocytosis of 6 to 10 bacteria and the other 21-30 bacteria per leucocyte.

It is shown in the graphs that one result of the aging of the individuals is an increase in the rapidity with which phagocytic activity is induced. Two weeks after the first injection of vaccine there was found with each higher age group a greater percentage of tests showing 16 bacteria or more per leucocyte. In the two oldest age groups there were even a few tests showing 31

TABLE 3

*Opsonocytophagic Response to Vaccination against Whooping Cough of Children in Group A Age Under 3 Months*

Average Number of Bacteria per Leuco- cyte	First Test before First Injection	Number of Tests					Per cent of Tests Showing Specified Number of Bacteria or More					
		Weeks after First Injection					First Test	Weeks after First Injection				
		1	2	3	4	5-6		1	2	3	4	5-6
Negative	66	14	27	9	8	3	100.0	100.0	100.0	100.0	100.0	100.0
1-5	..	..	3	3	10	3	.....	.....	10.0	59.1	84.9	91.9
6-10	..	..	..	1	6	2	.....	.....	.....	45.4	66.0	83.8
11-15	..	..	..	3	3	3	.....	.....	.....	40.9	54.7	78.4
16-20	..	..	..	1	4	5	.....	.....	.....	27.3	49.1	70.3
21-30	..	..	..	2	12	11	.....	.....	.....	22.7	41.5	56.8
31-40	..	..	..	3	7	4	.....	.....	.....	13.6	18.9	27.0
41-50	..	..	..	..	2	4	.....	.....	.....	.....	5.7	16.2
51-60	..	..	..	..	1	..	.....	.....	.....	.....	1.9	5.4
61-70	..	..	..	..	..	2	.....	.....	.....	.....	.....	5.4
Unsatisfactory or lost *	1	2	1	..	8	9	.....	.....	.....	.....	.....	.....
Total	67	16	31	22	61	46						

\* Unsatisfactory or lost omitted from per cent computations

TABLE 4

*Opsonocytophagic Response to Vaccination against Whooping Cough of Children in Group A Age 3 to 6 Months*

Average Number of Bacteria per Leuco- cyte	First Test before First Injection	Number of Tests					Per cent of Tests Showing Specified Number of Bacteria or More					
		Weeks after First Injection					First Test	Weeks after First Injection				
		1	2	3	4	5-6		1	2	3	4	5-6
Negative	77	20	22	6	6	1	100.0	100.0	100.0	100.0	100.0	100.0
1-5	7	..	5	4	5	1	8.3	.....	24.1	73.9	90.2	97.4
6-10	..	..	1	3	8	1	.....	.....	6.9	56.3	82.0	94.9
11-15	..	..	..	4	4	1	.....	.....	3.4	43.3	68.8	92.3
16-20	..	..	1	..	6	2	.....	.....	3.4	26.1	62.3	89.7
21-30	..	..	..	3	13	11	.....	.....	.....	26.1	52.5	84.6
31-40	..	..	..	1	14	11	.....	.....	.....	13.0	31.2	56.4
41-50	..	..	..	2	3	8	.....	.....	.....	8.7	8.2	28.2
51-60	..	..	..	..	2	3	.....	.....	.....	.....	3.3	7.7
61-70	..	..	..	..	..	..	.....	.....	.....	.....	.....	.....
Unsatisfactory or lost *	1	..	..	1	5	6	.....	.....	.....	.....	.....	.....
Total	85	20	29	24	66	45						

\* Unsatisfactory or lost omitted from per cent computations

bacteria or more per leucocyte at this time. By the 3rd week all of the age groups except the youngest showed a few tests with 41 bacteria or more per leucocyte. The consistent increase with age of both the amount and degree of phagocytic activity up to about the 4th week after the initial injections suggests that the earlier response of older individuals may be associated with the general increase in phagocytic activity

with age which is shown by the control tests.

Six weeks after the initial injection of vaccine, with the exception of the youngest age group, the earlier response of older individuals to antigenic stimuli had little influence with respect to the levels of phagocytosis reached at this time. This point is so similar in the age groups over 3 months as to indicate that the maximum level of phagocytic ac-

TABLE 5

*Opsonocytaphagic Response to Vaccination against Whooping Cough of Children in Group A  
Age 6 Months to 1 Year*

Average Number of Bacteria per Leuco- cyte	First Test before First Injection	Number of Tests					Per cent of Tests Showing Specified Number of Bacteria or More					
		Weeks after First Injection					Weeks after First Injection					
		1	2	3	4	5-6	First Test	1	2	3	4	5-6
Negative	62	12	11	4	3	2	100.0	100.0	100.0	100.0	100.0	100.0
1-5	10	3	4	..	2	..	13.9	25.0	45.0	75.0	94.8	95.4
6-10	..	1	..	2	1	1	.....	6.2	25.0	75.0	91.4	95.4
11-15	..	..	2	1	5	2	.....	.....	25.0	62.5	89.7	93.2
16-20	..	..	2	3	6	4	.....	.....	15.0	56.2	81.0	88.6
21-30	..	..	..	1	12	10	.....	.....	5.0	37.5	70.7	79.5
31-40	..	..	1	3	12	17	.....	.....	5.0	31.2	50.0	56.8
41-50	..	..	..	..	12	4	.....	.....	.....	12.5	29.3	18.2
51-60	..	..	..	2	5	4	.....	.....	.....	12.5	8.6	9.1
61-70	..	..	..	..	..	..	.....	.....	.....	.....	.....	.....
Unsatisfactory or lost *	1	2	..	1	3	5	.....	.....	.....	.....	.....	.....
Total	73	18	20	17	61	49						

\* Unsatisfactory or lost omitted from per cent computations

TABLE 6

*Opsonocytaphagic Response to Vaccination against Whooping Cough of Children in Group A  
Over 1 Year of Age*

Average Number of Bacteria per Leuco- cyte	First Test before First Injection	Number of Tests					Per cent of Tests Showing Specified Number of Bacteria or More					
		Weeks after First Injection					Weeks after First Injection					
		1	2	3	4	5-6	First Test	1	2	3	4	5-6
Negative	63	9	2	1	5	1	100.0	100.0	100.0	100.0	100.0	100.0
1-5	17	3	7	1	5	3	23.2	35.7	88.9	92.3	92.6	97.8
6-10	1	1	3	2	6	..	2.4	14.3	50.0	84.6	88.2	91.3
11-15	..	..	2	1	5	..	1.2	7.1	33.3	69.2	79.4	91.3
16-20	..	1	1	1	11	7	1.2	7.1	22.2	61.5	72.1	91.3
21-30	1	..	1	4	13	11	1.2	.....	16.7	53.8	55.9	76.1
31-40	..	..	2	..	14	10	.....	.....	11.1	23.1	36.8	52.2
41-50	..	..	..	1	9	10	.....	.....	.....	23.1	16.2	30.4
51-60	..	..	..	2	2	3	.....	.....	.....	15.4	2.9	8.7
61-70	..	..	..	..	..	1	.....	.....	.....	.....	.....	2.2
Unsatisfactory or lost *	2	..	..	..	1	4	.....	.....	.....	.....	.....	.....
Total	84	14	18	13	69	50						

\* Unsatisfactory or lost omitted from per cent computations.

tivity may be the same for these ages. For infants under 3 months the response 6 weeks after the first injection is not as great as in the older ages.

To determine the effect of irregular spacing of the vaccine injections on the response to vaccination, Table 7 was prepared showing a comparison of Group A and Group B. The comparison is made 2 weeks after the 5th injection of

vaccine since it is not feasible to examine the responses of Group B except at a definite period after completion of the course of vaccination. It is apparent from Table 7 that the extra periods of 1, 2, and 3 weeks between different injections at varying stages of the vaccination course had very little effect on the degrees of phagocytosis demonstrated 2 weeks after the last injection.

TABLE 7

Comparison of Opsonocytophagic Response of Children in Group A and Group B

Average Number of Bacteria per Leucocyte	Number of Tests		Per cent of Tests Showing Specified Number of Bacteria or More	
	Group A	Group B	Group A	Group B
Negative	7	1	100.0	100.0
1-5	7	1	95.8	97.7
6-10	4	2	91.6	95.4
11-15	6	..	89.2	90.7
16-20	18	6	85.5	90.7
21-30	43	12	74.7	76.7
31-40	42	9	48.8	48.8
41-50	26	10	23.5	27.9
51-60	10	2	7.8	4.6
61-70	3	..	1.8	....
Unsatisfactory or lost *	24	1	....	....
Total	190	44		

\* Unsatisfactory or lost omitted from per cent computations.

#### RESPONSE AFTER STIMULATING INJECTIONS

Observations were also made to determine the effect of a single stimulating injection of vaccine on the opsonocytophagic values when administered to vaccinated individuals sometime after the original course of vaccination. Due to difficulties in maintaining contact with patients over a period of many months it was not possible to accumulate any sizeable experience with the response following stimulating injections. We have, however, succeeded in getting 48 children back for both the stimulating injection and a later test. Control opsonocytophagic tests were performed at the time of the stimulating injection and response tests were made 2 weeks later. The stimulating injections were given subcutaneously and the size of the dose was either 0.5 ml. or 1.0 ml. These observations were made usually a year after the primary vaccination, but in a few instances the time interval was as short as 6 months.

Stimulating injections were also given to a group of individuals who had received the "standard" Sauer's vaccination \* 1 to 5 years before. The dose

for these individuals was 0.25 ml. given subcutaneously. These children were private patients and as a whole were considerably older than the clinic group.

Table 8 shows the level of opsonins at the time of the stimulating injection compared with the response observed 2 weeks later, according to the size of the stimulating injection. It is apparent that there is a rise of opsonins following the injection of a small stimulating dose of antigen. Comparison of the magnitude of response to the different size doses cannot be made, however, because of the differences in age distribution and the length of time since vaccination of the three groups. However, those children in the clinic group who received 1.0 ml. of vaccine as a stimulating dose showed a rise comparable to that attained following primary vaccination.

In 2 individuals in the tables shown and in 3 others whose tests have been left out because the time of the tests was irregular, we observed a decline in opsonins following the stimulating injections. Of these individuals, 3 were in the group who received 0.25 ml. as a stimulus and 1 each in the groups receiving 0.5 and 1.0 ml. Prior to injection all of these children had a relatively high level of opsonic activity and the degree of decline was never more than from one class to the next lower class.

#### SUMMARY AND DISCUSSION

Various field investigations of whooping cough vaccination procedures have indicated that large doses of a properly prepared *Hemophilus pertussis* vaccine produces immunity in a large proportion of the children. Assuming this to be true it seemed particularly desirable to investigate the effect of age on the serological responses of children to such vaccination.

\* This consists of administering a total of 8 ml. of vaccine containing 10 billion organisms per ml. over a period of 3 weeks, 1.0 ml. being given bilaterally the first week, and 1.5 ml. bilaterally the second and third weeks.

TABLE 8

*The Relation of Size of Dose to Opsonocytophagic Response  
Two Weeks after Stimulation*

Average Number of Bacteria per Leucocyte	Number of Tests According to Size of Stimulating Dose						Per cent of Tests Showing Specified Number of Bacteria or More					
	0.25 ml.		0.5 ml.		1.0 ml.		0.25 ml.		0.5 ml.		1.0 ml.	
	2		2		2		2		2		2	
	Con- trol	Weeks After	Con- trol	Weeks After	Con- trol	Weeks After	Con- trol	Weeks After	Con- trol	Weeks After	Con- trol	Weeks After
Negative	8	..	4	..	4	..	100.0	.....	100.0	.....	100.0	.....
1-5	5	..	3	1	1	..	42.9	.....	77.8	100.0	76.5	.....
6-10	..	..	2	3	5	..	7.1	.....	61.1	94.4	70.6	.....
11-15	1	1	2	1	..	..	7.1	100.0	50.0	77.8	41.2	.....
16-20	..	1	3	..	..	..	.....	92.9	38.9	72.2	41.2	.....
21-30	..	6	2	6	2	3	.....	85.7	22.2	72.2	41.2	100.0
31-40	..	4	2	3	1	2	.....	42.9	11.1	38.1	29.4	83.3
41-50	..	2	..	4	3	9	.....	14.3	.....	22.2	23.5	72.2
51-60	..	..	..	..	1	1	.....	.....	.....	.....	5.9	22.2
61-70	..	..	..	..	..	3	.....	.....	.....	.....	.....	16.7
Unsatisfactory or lost *	..	..	..	..	2	1	.....	.....	.....	.....	.....	.....
Total	14	14	18	18	19	19						

\* Unsatisfactory or lost omitted from per cent computations.

The measure of antibody response to whooping cough vaccination which we have used in this study is the opsonocytophagic reaction. It was recognized that the exact relation of this reaction to immunity is difficult to define, but it does not seem probable that a high degree of immunity can be developed without an opsonocytophagic response. Viewed in this way the results of the opsonocytophagic tests reported here suggest certain points which may be considered in attempting to develop a means for the control of whooping cough.

In this study it has been shown that the majority of infants and young children respond when systematically injected with a properly prepared *Hemophilus pertussis* vaccine by the production of relatively high levels of opsonic activity against the injected organisms. It is particularly noteworthy that very young infants, 6 weeks or more, seemed able to tolerate large injections of vaccine without reactions of serious consequence. The response to vaccination varied with the age of the child. Children under 3 months of age did not respond quite as rapidly as children

over 3 months of age. In general, the older the child the more rapidly a rise in phagocytic activity could be evoked.

It was also noted, however, that the degree of phagocytosis *prior* to vaccination varied with age in the same manner as the results of the opsonocytophagic tests after vaccination. This would suggest that perhaps in the younger infants there has been a lack of previous non-related infections which would serve as stimuli which would condition their response to vaccination.

The rapidity with which the opsonocytophagic response could be induced varied with age, but the capacity to respond seemed the same for all the ages investigated with the exception of children under 3 months.

The above findings have particular significance for the possible development of programs for the prevention of whooping cough by vaccination. The fact that vaccination can be done in the very young infant, where the major problem lies, is encouraging. The data suggest that dosages equal to or larger than those used in older children be used in immunizing the very young child. This and other points of the



vaccination procedure, such as the number of injections, are details which are open for further investigation.

Little information is available on the duration of protective immunity which may follow whooping cough vaccination. In this study relatively high levels of antibodies were found in many of the children a year or more after vaccination, but some of the children showed at that time very little or no phagocytosis. Those showing persistently elevated levels may have had exposure to whooping cough which served to maintain the level or they may represent individuals in whom the antibody level declines slowly, or both.

Although the level of opsonins remained relatively high for some time after the initial course of vaccination, there was a decline from the maximum level of response. The finding, therefore, that a single injection of vaccine 6 months to 5 years after primary vaccination serves to stimulate a rise in the opsonocytophagic response, is particularly pertinent. It suggests the possibility that in the young, where the disease is most apt to be severe and most likely to be attended by a fatal outcome, stimulating injections given at yearly intervals may help to prevent and control the diseases. Such injections may also be given whenever a

familial exposure to the disease occurs.

The best method of administering such stimulating injections requires further study. Further investigation is necessary both in the field and in the laboratory to determine the most feasible method of vaccination as a procedure in the public health program for the control of whooping cough.

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# Errors in Clinical Statements of Causes of Death\*

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THIS is the first of a series of contributions upon the statistical expression of error in certification of causes of death, based upon clinical findings and opinion, when compared with post-mortem protocols of the same cases. The primary collection of data and the plan of study have been under the auspices of the Joint Committee on Autopsies of the American Public Health Association and the American Hospital Association.

It has been planned to assemble records of 100,000 autopsied deaths (1900-1939) occurring in general hospitals where there was full-time pathologist service and a high average ratio of autopsies to deaths. Private funds have permitted the completion of 25,000 records prior to July 1, 1941, and it is hoped that another 20,000 can be obtained in the next twelve months.

Mortality rates as they appear in official reports of vital statistics by health department or other government

bureaus are affected by the two variables of frequency of occurrence and fatality of the respective diseases, and by the degree of accuracy inherent in the process of certification, registration, and tabulation of death returns.

An instance of the confusion and uncertainty as to death rates for an important cause of death was the discussion a decade or two ago concerning the reality of increase in cancer mortality. A definite answer must depend in this, as in similar questions, upon a recognition and correction of errors in clinically established statements of causes of deaths.

Discussions upon errors in clinical statements of causes of death will remain unprofitable until we begin to study by exact statistical methods the problem of diagnostic errors itself. There are only five attempts known to us in the literature dealing statistically with accuracy of diagnostic statements, all comparing clinical statements upon causes of death with autopsy protocols.<sup>1-4</sup>

In addition we have had access to the original text of a paper presented on this subject by George H. Van Buren before the Statistical Section of the American Public Health Association at its meeting in Chicago, Ill., in 1918, but not published.

The data used in the present report

\* Read before the Vital Statistics Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 17, 1941.

NOTE 1—Dr. Kurt Pohlen has been responsible for the statistical analyses now presented. Drs. Eric Seligmann and Kurt Hirschmann have assisted in the abstracting, sorting, tabulation, analysis and interpretation of the clinical records and autopsy protocols.

NOTE 2—Additional tables and charts not published in the *Journal* because of lack of space may be obtained by writing either author.



of these diseases are due to mentioning secondary stages of such diseases instead of the origin of the infection (e.g., otitis media and encephalitis). Then follow deaths due to accident, the causes of which usually are quite accurately stated.

To give an idea of the methods and results of our study we offer a brief discussion of deaths from malignant tumors. From the records of ten general hospitals, totalling about 20,000 cases, we found 4,051 cases in which either upon autopsy, or by clinical statement of cause of death, or in the admission diagnosis to hospital some form of malignant or unspecified tumor was mentioned. Among the 4,051 cases were 3,462 in which the autopsy report showed some form of malignancy as primary cause of death, including a minority of cases where the tumor was contributory to another disease.

In addition to these 3,462 cases were 271 cases in which the malignant tumor, usually in a very early stage, caused no clinical symptoms and was incidentally discovered in the course of the autopsy as a contributory condition.

The problem of diagnostic accuracy must be considered from two different

and quite independent points of view: the topographic or anatomic site and etiological diagnosis. A diagnosis is wholly accurate only when both factors, the etiologic and topographic, are correct. All other diagnoses must be looked on as more or less incorrect. The problem is to divide the cases into categories of greater and lesser accuracies. Let us compare for instance two kinds of diagnostic changes by autopsy: first, where clinically an intestinal malignant obstruction was mentioned, which at autopsy proved to have been due to a cancer of the sigmoid, or where the clinical statement was carcinoma of the bile ducts and the corresponding pathologic statement carcinoma of the pancreas with metastases in the bile ducts and colon; and, second, where clinically a liver cirrhosis was observed which proved to be a carcinoma of the liver secondary to cancer of the stomach. In the first two instances the clinical diagnoses were at least partly correct, and in the third case there is a real mistake. We have based all changes of diagnosis upon the autopsy findings. We have classified each diagnosis according to its etiologic and topographic accuracy, and have distinguished five

TABLE 1

*Diagnostic Approval of Clinical Statements of Causes of Death by Autopsy Topographically*

Cases of malignant tumors as found with autopsy were previously diagnosed at Clinical statement of causes of death		Partly Correct					Total	
		Correct	Site of malignancy was given only in general terms		Incorrect			
			Site of extension or metastasis was mistaken for of body region or primary site	Site of malignancy was given only in general terms	Other organ was mistaken for site of tumor	No site of disease was given		
Correct		2,311	145	26	97	93	2,672	
Etiologically	Partly correct	Other distinct form of malignancy was mistaken for correct form of tumor	37	9	7	15	19	87
		Nature of tumor was given only in general terms as "malignancy" or "tumor"	174	48	31	18	16	287
	Incorrect	Non-malignant disease was mistaken for correct tumor	119	29	18	113	28	307
		No form of disease was given	23	5	24	16	41	109
Total!		2,664	236	106	259	197	3,462	

All Forms of Malignant Tumor.

TABLE 2  
Malignant Tumors According to Correct Clinical Diagnoses and Cases of Malignancy Contributory to Other Diseases

Primary site of malignancy	Cases diagnosed correctly at clinical statement of causes of death				Cases of malignancy found additionally to cases of column 2 as contributory causes to other non-malignant primary causes of death				Cases diagnosed as malignancy or unspecified form of tumor not verified at autopsy to be any form of malignancy	
	Total of malignancies as diagnosed by autopsy	With regard to both topographic and etiologic statement		With regard to topographic etiologic statements only % of col. 2 (details see Table 3)	Number	also correctly diagnosed at admission to hospital		Number	% of col. 2	
		% of col. 2	admission to hospital			Number	% of col. 2			
1	2	3	4	5	6	7	8	9	10	11
Breast	229	219	96	200	96	97	8	3.5	...	...
Pharynx, Larynx	56	47	84	40	86	95	...	...	1	1.8
Lung	321	200	62	134	77	70	24	7.5	12	3.7
Esophagus	99	81	82	58	86	90	...	...	7	7.1
Stomach	487	351	72	243	77	85	40	8.2	22	4.5
Small Intestine	24	7	29	2	29	50	12	50.0	...	...
Cecum, Appendix	35	17	49	7	51	71	5	14.3	...	...
Colon	154	109	71	54	75	80	27	17.5	9	5.8
Sigmoid, Sigmoid-Colon	179	129	72	68	72	83	20	11.2	4	2.2
Rectum, Recto-sigmoid	251	220	88	174	89	90	10	4.0	4	1.6
Pancreas	171	98	57	43	60	79	6	3.5	14	8.2
Brain	253	77	30	26	91	31	17	6.7	18	7.1
Liver	50	13	26	1	66	44	2	4.0	6	12.0
Gallbladder	71	35	49	9	55	87	3	4.2	5	7.1
Bile ducts	60	22	37	1	53	70	3	5.0	...	...
Kidney	83	46	55	22	68	64	18	21.7	3	3.6
Urinary Bladder	144	112	78	66	81	85	5	3.5	7	4.9
Prostate	129	95	74	61	81	81	38	29.5	1	0.8
Uterus-Corpus	66	43	65	30	71	77	6	9.1	3	4.5
Cervix	80	69	86	60	86	95	6	7.5	2	2.5
Ovaries	114	80	70	51	75	86	5	4.4	1	0.9
Thyroid	25	19	76	16	80	84	4	16.0	2	8.0
Bones	68	48	71	23	74	75	1	1.5	2	2.9
Lymphnodes (Lymphosar-comatosis)	69	39	58	26	70	65	1	1.4	2	2.9
Other sites	244	133	55	81	65	68	20	8.2	23	9.4
Total	3,462	2,311	67	1,496	77	77	271	7.8	148	4.3

different expressions of relative diagnostic accuracy, with all possible combinations. As shown in Table 1 we have topographically and etiologically correct, partly correct, and incorrect diagnoses; basing the decision upon autopsy findings and considering whether or not the clinical diagnosis was correct, partly correct, or incorrect. The partly correct diagnoses of malignancies are divided into those where the site of extension of tumor or site of metastasis was incorrectly given for the primary site and those in which inaccurate terms were used, as where the site of malignancy was given only generally as body region or cavity (abdomen, intestinal, etc.). On etiologic classification we divide the partly correct diagnoses into those where another form of malignancy was mistaken for the correct form of tumor (carcinoma versus sarcoma, etc.) or those where the form of tumor was inaccurately described by "malignancy" or "tumor" of ..... which sometimes indicates exclusively a distinct form of tumor and sometimes permits of two or more alternatives. The incorrect diagnoses were both, etiologic and topographic, divided into incorrect but definite diagnoses and cases where no site or cause was given or only a general symptom was mentioned (obstruction, etc.).

Among 3,462 cases of malignant tumors we find 2,311, or two-thirds, correct in both ways, 2,672, or 77 per cent, etiologically correct, and about as many, 2,664, topographically correct. We see that 145 plus 26 cases were etiologically correct but topographically only partly correct, and on the other hand 37 plus 174 cases topographically correct but etiologically partly correct; and that 9 plus 7 plus 48 plus 31 were partly correct under each category. The total of diagnoses considered as partly correct in one or both ways, but in no way completely incorrect is then 477, or

14 per cent. Those diagnoses incorrect under each category numbered 113 plus 28 plus 16 plus 41 cases, totalling 198, or 6 per cent. We must consider as incorrect also those 476 cases which were so either on account of topographic or etiologic error.

By arranging clinical diagnoses by anatomical site in order of per cent of correct diagnoses, we find that the number of entirely correct diagnoses decreases from 96 per cent (breast tumors) to 26 per cent (liver tumors). We always find a high per cent of accuracy in those diseases which can be recognized easily or give marked and characteristic symptoms. An 80 per cent accuracy or more is found for malignant tumors of breast, rectum (including recto-sigmoid), cervix, pharynx and larynx, esophagus. At the other end of the list we find less than 50 per cent correct diagnoses for malignant growths of the liver, small intestine, brain, and bile duct. Since we have recorded in our abstracts also the diagnoses on admission to the hospital we can count the number of cases in which both diagnoses, the admission and final clinical, were correct. This occurred in 1,496 cases, or 43 per cent, chiefly in cases where there had been readmission for the same diseases, from which conditions after previous operations became worse again. The range of such correct diagnoses at both admission and at death is from 87 per cent (breast) to less than 2 per cent (bile ducts) and demonstrates the difficulty of early diagnosis of some deep-seated malignant neoplasms. Details can be seen in Table 2, column 5.

When we compare the ratio between percentages of topographic and etiologic accuracy in the diagnoses of malignant tumors we find for some organs similar percentages, breast (96 and 97 per cent), rectum (89 and 90 per cent), prostate (both 81 per cent), and in other organs the topographic or etiological diagnosis

less correct, as in small intestine 29 per cent topographically, 50 per cent etiologically, and in bile ducts 53 per cent and 70 per cent respectively, while malignant tumors of brain and liver show the reverse conditions with higher accuracy in topographic diagnosis 91 per cent to 31 per cent, and 66 per cent to 44 per cent respectively.

The usual cause-specific mortality statistics apply to only one primary cause, neglecting all contributory conditions. We have concern to know the total frequency of deaths related to a particular disease, disregarding the difference between primary and contributory causes of death. In cases where a malignant neoplasm occurs coincidentally with another disease, preference is usually given in registration practice to the neoplasm. We followed the same rule in our study. But often there are found at autopsy very small early neoplasms which cannot be properly considered as a primary cause of death because they have caused no pathologic symptoms. The ratio of

those contributory malignant growths to the primary cause of death depends upon the speed of growth and upon the symptoms which such small neoplasms make.

We find high percentages of clinically undiscovered neoplasms in the intestine, especially the small intestine, in the prostate, kidney, and thyroid, while bones, lymph nodes, esophagus, pharynx and larynx seldom show a clinically undiscovered neoplasm. This is, so far as bones are concerned, partly due to the limitations of profitable clinical examination.

The discussion of accuracy of malignant tumors would not be complete if we did not mention those cases where a malignant neoplasm (or an unspecified tumor) was clinically diagnosed, which by autopsy was proved to be another and non-malignant disease. In 148 instances such incorrect statement was made, relatively most frequently with regard to the liver, pancreas, thyroid, and esophagus. Eighteen times a malignant tumor of the liver with precise

TABLE 3  
Malignant Tumors of 18 Most Frequent Sites With and Without Metastases

Primary site of malignancy	Malignant tumors of 18 most frequent primary sites							
	Total	Without metastases		With metastases		Number of metastases found with tumors of col. 4		
		No.	in % of col. 2	No.	in % of col. 2	Number	in % of col. 2	in % of col. 5
1	2	3	4	5	6	7	8	9
Stomach	476	130	27.3	346	72.7	1,109	233.0	320.5
Lung	325	63	19.4	262	80.6	941	289.6	359.2
Rectum	239	114	47.7	125	52.3	358	149.8	286.4
Breast	227	20	8.8	207	91.2	1,133	499.1	547.3
Sigmoid	199	92	46.2	107	53.8	254	127.7	237.3
Pancreas	176	52	29.5	124	70.5	367	208.5	296.0
Bladder	148	102	68.9	46	31.1	108	73.0	234.8
Colon	146	86	58.9	60	41.1	187	128.1	311.6
Prostate	120	39	32.5	81	67.5	253	210.8	312.3
Ovaries	115	12	10.4	103	89.6	433	376.4	420.7
Esophagus	101	38	37.6	63	62.4	105	104.0	166.6
Kidney	92	14	15.2	78	84.8	308	334.9	395.0
Cervix	75	36	48.0	39	52.0	103	137.3	264.1
Gallbladder	69	24	34.8	45	65.2	176	255.1	391.0
Bile ducts	63	28	44.5	35	55.5	86	136.5	245.7
Uterus-Corpus	59	20	33.9	39	66.1	149	252.4	382.0
Pharynx-Larynx	57	39	68.4	18	31.6	43	59.7	238.9
Liver	49	12	24.5	37	75.5	116	236.8	313.6
Total 18 most frequent sites	2,736	921	33.7	1,815	66.3	6,129	224.2	337.9

or inaccurate etiologic cause stated, was clinically correctly diagnosed, and six times such a neoplasm was incorrectly stated. In column 10 of Table 2 we present the number of cases (148) diagnosed at autopsy with the primary causes of death other than malignant tumor.

The complete statistics of primary and secondary (or contributory) factors causing death enable us to judge the prevalence of metastases with respect to primary sites. Some malignant neoplasms tend to spread easily and some do not.

We deal in our autopsy statistics only with those cases of cancer that died from that disease. We do not have, therefore, those cases of breast carcinoma where early cases were successfully treated, such being mostly cases without metastases. As we find that 91 per cent of breast cancer cases had metastases (in our series), we may conclude that breast cancer was fatal in few cases having no metastases. But besides the breast we find an interesting series of other organs, according to frequency of metastases, beginning with ovaries (90 per cent cases with metastases) and ending with bladder (31 per cent with metastases). We find relatively most metastases with malignant tumors of the breast, ovaries, kidney, gall bladder, and uterus, and few with such neoplasms of the esophagus, pharynx, larynx, bladder, sigmoid, and bile ducts. On the average we have for the 18 most frequent original sites of malignant tumors one-third of the cases without, and two-thirds with metastases, and there are about three and one-third per case having metastases.

In Table 4 there are tabulated 6,129 metastatic neoplasms by 37 categories of site related to the occurrence of death attributed to one of 18 primary sites of the neoplasm in 2,736 cases. (We should mention here that the difference between the total number of

deaths due to primary neoplasms of various sites in Table 3 and 4 (column 2) is due to those cases omitted in either study for which there was incomplete data for the one or other item).

We have calculated the ratios of metastatic frequencies to each 100 cases of primary tumors. We find lymph nodes reported as affected by metastases in 42 per cent of all primary sites together, liver metastases in 34 per cent, and lung metastases in 21 per cent. Next in frequency of involvement come peritoneum, 16 per cent, adrenal and pleura 11 per cent. All other sites are involved in less than 10 per cent of the cases.

When we now compare the ratios for the specified primary sites with the corresponding ratios for all primary sites together, we get an expression of the relationship between primary and secondary sites of malignant neoplasms. In Table 5 we have the result of such comparison (quotients of specified site through total of sites). Coefficients higher than one indicate a higher frequency than would be expected by rule of chance, and lower than one indicates a smaller frequency than expected.

We must take into account that often the numbers of cases involved are small and give rise to a considerable statistical error.

We note that primary carcinoma of the stomach tends rarely to metastasize in the breast, but that primary malignant breast neoplasms tend more commonly to metastasize in the stomach; that primary carcinoma of the lung relatively frequently develops metastases of the pharynx and larynx. The only metastases developing in the rectum with over-average frequency are those following primary carcinoma of the prostate. In a complete list every combination of two organs is listed twice, each of both organs being once a primary and once a secondary site. While primary







carcinoma of the esophagus does not tend to metastasize in the gall bladder, we find that the esophagus as site of secondary neoplasms receives its metastases relatively more frequently from primary neoplasms of the gall bladder than from other sites. The highest relation between two organs in our list (Table 5) is that between both single breasts. It must be understood that statistically adequate ratios must await the use of a larger series of case histories for malignant neoplasms in relatively rare sites, both primary and secondary.

It will be obvious that the above analysis of the deaths due to cancer is

of value chiefly at this stage as a test of the method of study and its usefulness in supplying us with some approach to desirable criteria or mathematical indices of error to be expected and to be allowed for when preparing specific cause-mortality rates, based upon clinical diagnoses of varying degrees of inaccuracy or incompleteness.

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# Relative Toxicity of Certain Antiseptics Containing Soap and Alcohol

With Special Reference to Mouth Washes \*

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IN 1939 a method was presented<sup>1</sup> for the evaluation of germicidal compounds in which the toxicity of such substances for a circulating tissue (human or guinea pig blood) was compared with the toxicity of these compounds for a standard strain† of *Staphylococcus aureus*. A toxicity index was computed by dividing the greatest dilution of the compound under test toxic for tissue by the greatest dilution capable of killing the test organism. The mechanism of the toxic action of germicides on whole blood used as a tissue measured by the loss of the phagocytic activity of leucocytes and the use of hemolytic complement to determine the toxic effect were subsequently studied.<sup>2, 3</sup> Our results showed that although some indication of the toxic effect of germicides could be determined by observation of hemolysis, or coagulation, or by measuring the destruction of hemolytic complement, utilization of the phagocytic function of the leucocyte, as an index of toxicity gave the most exact and consistent results. Germicides tested with this method by different technicians consistently have shown the same "toxic endpoint" and no variations in these

endpoints are observed when different human bloods or different guinea pig bloods are used in the test. A ready reference of the toxic effect of the compounds studied is possible since permanent blood smears may be prepared and kept on file.

In addition to the technical advantages of the proposed method, the use of blood, a tissue which is uniform in its makeup and reaction, to determine the toxic action of germicides approaches the actual conditions of use of these substances in or on the human body more nearly than other tissue methods and, further, the use of the phagocytic function of the leucocyte as an indication of the toxic action of these compounds appears especially appropriate since the purpose of antiseptic substances is to augment rather than retard the natural defenses of the host. In a recent publication, Fleming<sup>4</sup> points out that "In a septic wound in which the infection had become established, the pus had considerable antibacterial powers which were lost when the cells were killed by heat, drying or by treatment with antiseptics." He further states that "Any chemical which was more destructive to leucocytes than it was to bacteria was very unlikely to be effective as a direct antiseptic in a septic wound."

In studying a group of compounds insoluble in water, the appreciable tox-

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† This strain of *Staphylococcus aureus* has a standard resistance to phenol maintained for testing germicidal substances in the Food and Drug Administration, Washington, D. C.

icity of alcohol used as solvent and the marked toxicity of soap solution, used as an emulsifying agent, attracted attention. After obtaining toxicity indices on alcohol and castile soap, the influence of these substances on the toxicity and germicidal action of phenol was investigated. Solutions of phenol dissolved in 50 per cent alcohol and in 5 per cent castile soap solution were used as a dilution basis.

The toxicity of an aqueous solution of phenol for guinea pig tissue has been demonstrated<sup>1</sup> to be 1:500. When 5 per cent phenol is mixed with an equal amount of alcohol before dilution, its toxicity is markedly increased to 1:1,800 and in 5 per cent soap solution the toxicity is further greatly increased to 1:6,500. Correspondingly, the toxicity index increases from 5.0 (phenol in water) to 9.0 (phenol in alcohol) to 43.3 (phenol in soap solution). These results are shown in Table 1. Although the bactericidal dilution of aqueous phenol is 1:100 under the conditions of this test, a 1:200 dilution of an alcoholic solution of phenol is germicidal, and while the use of soap solution as a solvent for phenol increases the toxicity greatly over that of phenol in alcohol, there is not a corresponding increase in germi-

cidal efficiency. On the contrary, the germicidal power is decreased by 25 per cent under that shown by phenol in alcohol.

In testing some essential oils and other compounds insoluble in water, a similar phenomenon was noted (Table 1). Those oils dissolved in alcohol (50 per cent or 100 per cent, depending on the solubility of the oil) were considerably less toxic than when emulsified in 5 per cent soap solution. Perhaps the most striking example is that of thymol which is toxic for tissue in a dilution of 1:2,500 when dissolved in alcohol (50 per cent), while emulsified in 5 per cent soap solution it is toxic in a dilution of 1:18,000. The toxicity indices are correspondingly widely divergent, since an index of 1.3 is obtained with thymol in alcohol and 45.0 with thymol in soap solution. Chlorothymol also shows a similar phenomenon. An excellent index of 0.83 is obtained when this substance is dissolved in alcohol, while a marked increase to 20.0 is found when soap solution is used as carrying agent. It should be noted that since the concentrations of alcohol and soap are also diminished on dilution, the concentration of alcohol at the toxic endpoint of

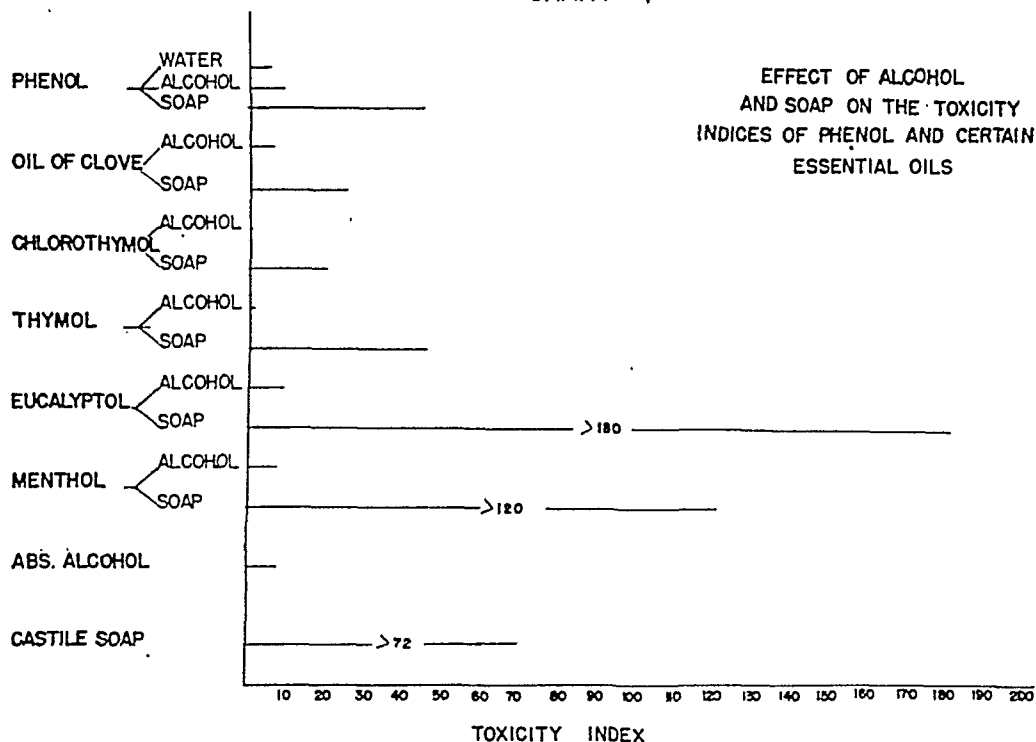
TABLE 1

*Relative Toxicity and Toxicity Indices of Certain Germicidal Substances Containing Soap or Alcohol*

Compound	Solvent	Tissue Toxicity		Toxicity for Staphylococci		Toxicity Index
		Toxic Endpoint	% Alcohol or Soap	Germicidal Dilution	% Alcohol or Soap	
Phenol	Water	1:500	..	1:100	..	5.0
Phenol	Alcohol	1:1,800	2.7	1:200	10.0	9.0
Phenol	Soap	1:6,500	0.08	1:150	1.3	43.3
Oil of Clove	Alcohol	1:2,000	2.5	1:300	6.6	6.6
Oil of Clove	Soap	1:2,500	0.04	1:100	1.0	25.0
Chlorothymol	Alcohol	1:2,500	2.0	1:3,000	1.7	0.83
Chlorothymol	Soap	1:10,000	0.05	1:500	1.0	20.0
Thymol	Alcohol	1:2,500	2.0	1:2,000	2.5	1.3
Thymol	Soap	1:18,000	0.03	1:400	1.3	45.0
Eucalyptol	Alcohol	1:1,400	3.6	1:150	13.3	9.3
Eucalyptol	Soap	1:4,500	0.02	1:25*	4.0	>180
Menthol	Alcohol	1:1,500	3.3	1:200	10.0	7.5
Menthol	Soap	1:3,000	0.03	1:25*	4.0	>120
Abs. alcohol		1:30	..	1:4	..	7.5
Castile soap		1:1,600	..	1:25*	..	>72

\* Not germicidal at dilution indicated

CHART I



thymol was 2 per cent and the concentration of soap only 0.03 per cent. In Table 1 it will be observed that all the substances tested showed a marked increase in toxicity for tissue and a definite decrease in germicidal activity when alcohol was replaced by soap as a solvent. For comparative purposes, the toxicity indices of absolute alcohol and the castile soap used in these studies were determined. It will be observed that absolute alcohol is toxic for tissue at 1:30 and germicidal at 1:4, while castile soap is toxic at 1:1,800 and is *not* germicidal at 1:25. The toxicity index of alcohol is 7.5, while that of soap is greater than 72. The differences in toxicity indices, depending on the use of alcohol or soap as a solvent, are shown graphically in Chart 1.

The results presented in Table 1 and illustrated in Chart 1 reveal that the toxicity of the principal substance in an antiseptic solution may be of very minor importance and that of the menstruum may assume the rôle of primary

importance. For example, the toxicity of phenol determined in aqueous solution offers no clue to its toxicity in the presence of even small amounts of alcohol or soap. To a lesser degree the same is true of its germicidal properties; but, as has been pointed out, the two effects are not proportional. It is quite obvious that a substance found to have a comparatively favorable toxicity index may have a relatively unfavorable index in a different menstruum or upon the addition of even small amounts of other substances.

It was demonstrated in a previous paper that a slight increase in the concentration of table salt increased the toxicity of phenol. Thus in the case of the compounds listed in Table 1 which are not soluble in water, the toxicity of the basic substance has not been measured but only that of a combination of substances from which it is not possible to deduce the toxic qualities of the individual components. It should be remembered that the figures given for toxicity are not those dilu-

TABLE 2  
Toxicity Indices of 87 Mouthwashes

Mouthwash	% Alcohol	Tissue Toxicity	Toxicity for Staph.	Index	Mouthwash	% Alcohol	Tissue Toxicity	Toxicity for Staph.	Index	Mouthwash	% Alcohol	Tissue Toxicity	Toxicity for Staph.	Index
Aldie	25	1:5	N.G. 1:2.5	>2	Mil-31	25	1:5	N.G. 1:2.5	>2	Yorik	30	1:5	N.G. 1:2.5	>2
Amber	30	1:5	N.G. 1:2.5	>2	Minlin	25	1:5	N.G. 1:2.5	>2	Z-L	25	1:5	N.G. 1:2.5	>2
Asseptisol	25	1:5	N.G. 1:2.5	>2	Minard's	28	1:5	N.G. 1:2.5	>2	Antiseptine	25	1:10	N.G. 1:2.5	>4
Baifaline	10	1:5	N.G. 1:2.5	>2	Nurse Brand	28	1:5	N.G. 1:2.5	>2	Arco	30	1:10	N.G. 1:2.5	>4
Benaco	25	1:5	N.G. 1:2.5	>2	Nyseptol	28	1:5	N.G. 1:2.5	>2	Cepacol	18	1:10	N.G. 1:2.5	>4
Boggs & Buhl	30	1:5	N.G. 1:2.5	>2	Parker's Brand	25	1:5	N.G. 1:2.5	>2	Dentiseptine	6	1:10	N.G. 1:2.5	>4
Bordlene	25	1:5	N.G. 1:2.5	>2	Park's	28	1:5	N.G. 1:2.5	>2	Hydrosol	0	1:10	N.G. 1:2.5	>4
Calox	30	1:5	N.G. 1:2.5	>2	Pasteur's	30	1:5	N.G. 1:2.5	>2	Jermene	0	1:10	1:5	2
C.B.L.	0	1:5	N.G. 1:2.5	>2	Peerless	26	1:5	N.G. 1:2.5	>2	Kleenzo	25	1:10	N.G. 1:2.5	>4
Camp Enol †	0	1:5	N.G. 1:2.5	>2	Pepsodent	26	1:5	N.G. 1:2.5	>2	Paneco	20	1:10	N.G. 1:2.5	>4
Caulk Mercian	8	1:5	N.G. 1:2.5	>2	Prescott's	30	1:5	N.G. 1:2.5	>2	Pentacresol	30	1:10	1:2.5	>4
Chappelle	25	1:5	N.G. 1:2.5	>2	Purepac	28	1:5	N.G. 1:2.5	>2	Reliance	26	1:10	N.G. 1:2.5	>4
Chartex	5.6	1:5	N.G. 1:2.5	>2	Puritan	25	1:5	N.G. 1:2.5	>2	S.K.F.	28	1:10	N.G. 1:2.5	>4
Cheney's	25	1:5	N.G. 1:2.5	>2	Rel-Ka-Sol	12	1:5	N.G. 1:2.5	>2	Squibb	26-29	1:10	N.G. 1:2.5	>4
Connor's	26	1:5	N.G. 1:2.5	>2	Rx-37	25	1:5	N.G. 1:2.5	>2	White Cross	25	1:10	N.G. 1:2.5	>4
Courtier	25	1:5	N.G. 1:2.5	>2	Rx-59	25	1:5	N.G. 1:2.5	>2	Zhongiva	36	1:10	N.G. 1:2.5	>4
Drucol	26	1:5	N.G. 1:2.5	>2	Sago	28	1:5	N.G. 1:2.5	>2	Borolyptol	8	1:15	N.G. 1:2.5	>6
Five Star *	0	1:5	N.G. 1:2.5	>2	Sanalin	28	1:5	N.G. 1:2.5	>2	Waites Anti-Pyo	25	1:15	N.G. 1:2.5	>6
Forhan's	10	1:5	N.G. 1:2.5	>2	Sanative	28	1:5	N.G. 1:2.5	>2	Extol	50	1:20	1:2.5	8
H.A.S. Solution	25	1:5	N.G. 1:2.5	>2	Sandford's	0	1:5	N.G. 1:2.5	>2	Hychlorite	0	1:20	1:10	2
Hospital	25	1:5	N.G. 1:2.5	>2	Septesol	25	1:5	N.G. 1:2.5	>2	Mark 4	60	1:20	1:10	2
Iodoseptie †	0	1:5	N.G. 1:2.5	>2	Silverline	25	1:5	N.G. 1:2.5	>2	Salzino	25	1:20	N.G. 1:2.5	>8
Jameson's	25	1:5	N.G. 1:2.5	>2	S.T. 37	0	1:5	N.G. 1:2.5	>2	Zonite	0	1:20	1:7.5	2.7
Kent	28	1:5	N.G. 1:2.5	>2	Steven's	28	1:5	N.G. 1:2.5	>2	Fo-Fen-x	88.5	1:25	1:5	5
Kojene	0	1:5	N.G. 1:2.5	>2	Stomaseptine *	0	1:5	N.G. 1:2.5	>2	Gilbert's	0	1:30	N.G. 1:2.5	>12
La Cross	25	1:5	N.G. 1:2.5	>2	Thorol	25	1:5	N.G. 1:2.5	>2	Astring-O-Sol	70	1:40	1:5	8
Laymon's	25	1:5	N.G. 1:2.5	>2	United Whelan	28	1:5	N.G. 1:2.5	>2	Afko	70	1:50	1:5	10
Listerine	25	1:5	N.G. 1:2.5	>2	Vick's	25	1:5	N.G. 1:2.5	>2	NOTE: N.G.=not germicidal at dilution given * In powder form, prepared as directed † Diluted as directed for mouthwash				
Marlo	25	1:5	N.G. 1:2.5	>2	Wampole's Bon.	15	1:5	N.G. 1:2.5	>2					
Met-O-Sol	14	1:5	N.G. 1:2.5	>2	Wampole's For.	15	1:5	N.G. 1:2.5	>2					

tions which are sufficiently toxic to reduce phagocytosis but those which prevent all phagocytic activity. In the case of phenol in alcohol, for example, the percentage of alcohol in the final dilution is below the range of absolute toxicity of this substance but not necessarily beyond the limits of all toxicity; and it is not possible to judge whether the toxic endpoint obtained is due primarily to this concentration of alcohol augmented with small amounts of phenol, or whether the reverse is true, or whether the explanation is to be found in a mutually synergistic action. In any event, the increase in toxicity is too great to be accounted for by the additive effect of the two compounds taken singly. It is known that bacterial spores are not killed by alcohol, yet it has been shown in this laboratory (unpublished) that in the presence of a definite percentage of alcohol 5 per cent hydrochloric acid becomes as sporicidal as a 20 per cent aqueous solution of hydrochloric acid. Decreases or increases in the percentage of alcohol give a decreased efficiency. Cade<sup>5</sup> has shown that the germicidal action of phenol and certain related compounds can be greatly increased by the addition of the proper amounts of soap, and that the optimal amount varies not only with type of soap but with the compound to which it is added. This being the case with germicidal effect, it is logical to suppose that with the apparently much greater sensitivity of tissue to soap, the critical amount is even more important. No attempt was made to determine those concentrations of soap most affecting the toxicity of the various compounds. It should be stated that in some of the dilutions tested in determining the endpoint, complete solubility was not always obtained.

Inasmuch as essential oils are contained in a great majority of mouthwashes, and alcohol is made use of as

a solvent, and since it is common for these preparations to be recommended for use undiluted as well as for application to cuts and scratches or as general antiseptics, it becomes of interest to determine whether they are free of significant toxicity. In the present study toxicity index tests on a group of 87 commercial mouthwashes are included. The results are summarized in Table 2, where the toxicity for tissue and bactericidal power for *Staphylococci* of 87 mouthwashes are given and the toxicity index of each computed. Of the 87 mouthwashes studied, 62 were toxic for tissue in a dilution of 1:5; 14 were toxic for tissue in a dilution of 1:10; 2 were toxic in a dilution of 1:15; 5 were toxic in a dilution of 1:20, and one each was toxic at dilutions of 1:25, 1:30, 1:40 and 1:50.

None of the mouthwashes toxic at 1:5 was capable of killing the standard strain of *Staphylococcus aureus* (209) under the conditions of this test at a final dilution of 1:2.5. The toxicity index in each case was therefore greater than 2.0. Of those mouthwashes in the group toxic for tissue at 1:10, it was possible to compute accurately the toxicity index of only two, Jermene and Pentacresol. These mouthwashes had indices of 2.0 for the former and 4.0 for the latter, and all others in this group had indices greater than 4.0, since none was germicidal in a dilution of 1:2.5. Neither one of the mouthwashes toxic in a 1:15 dilution was germicidal in a 1:2.5 dilution, and their indices were, therefore, greater than 6.0, while 4 of the 5 toxic for tissue at 1:20 were germicidal under the conditions of this test, one in a dilution of 1:10. In this group, Extol had a computed toxicity index of 8.0, Hychlorite Solution an index of 2.0; Mark 4 an index of 2.0; Zonite an index of 2.7; and Salzinco, which was not germicidal at 1:2.5, had an index greater than 8.0. Of the remaining 4 mouth-



washes in this series, Fo-fen-x, Gilbert's, Astring-o-sol and Afko, "toxic end-points" of 1:25, 1:30, 1:40 and 1:50, respectively, were obtained. All but Gilbert's mouthwash were germicidal at a 1:5 dilution. This mouthwash, being not germicidal at a 1:2.5 dilution, had an index greater than 12, while the toxicity index of Fo-fen-x was 5, that of Astring-o-sol 8, and Afko 10. It should be noted that the toxicity index number represents the number of times the mouthwash is more toxic for tissue than it is for the test organism. It will be remembered that in determining the toxicity index, both tests contain whole blood; the toxicity test 40 per cent, the germicidal only 10 per cent, and that toxicity is measured not at the dilution affecting normal phagocytosis but at the weakest dilution which prevents all phagocytic activity.

It is of interest that of the 76 mouthwashes tabulated and found to be toxic at a 1:5 or 1:10 dilution, 56 of these are *Liquor antisepticus* type, while of the 11 remaining in this series toxic in dilutions from 1:15 to 1:50, only one is definitely this type. Of the 87 mouthwashes tested, only 9 were germicidal under the conditions of the test, and these varied in their indices from 2 to greater than 12. It is quite apparent that those mouthwashes showing definite germicidal power correspondingly showed greater toxicity for tissue. Of the 62 found to be toxic when diluted 1:5, 54 are offered for use undiluted; furthermore, 9 of the 14 found toxic in a 1:10 dilution bear a similar recommendation. Of this group toxic at 1:5 or 1:10, 74 of the 76 so-called antiseptics were unable in 30 minutes to kill all *Staphylococcus aureus* present under the conditions of this test.

#### COMMENT

In presenting the above data, no

thought of discrimination or special examination is connected with any of the preparations used. Indeed, the results amply show that no special credit or discredit can be ascribed to any individual preparation or type of compound. The object in collecting the results is part of a general study of germicidal substances. It is felt that by a comparison of a number of substances tested by different methods and types of methods our knowledge of the effective uses of germicides can gradually be increased.

Although this test possesses considerable practical value, the impossibility of evaluating antiseptics for all their diverse uses by results of this method alone is thoroughly recognized. On the other hand, the results in Table 2 illustrate several generalities perhaps well known but too seldom considered. Not one of the preparations tested approaches the classical conception of an ideal antiseptic. On the contrary, the results demonstrate that if used on cuts, scratches, or open wounds for which purpose many bear recommendations, not only would the majority fail to produce complete germicidal effect but their presence would continue to prevent the normal protective action of the blood after germicidal value was lost. The importance of Fleming's contention, quoted earlier, is emphasized by these figures, which also might well be used to point out the inadvisability and possible harm caused by the indiscriminate use of antiseptics for a variety of conditions and purposes without ample consideration of the results likely to be obtained in a particular condition.

It might be contended that the unfavorable balance between toxicity and germicidal ability of the preparations tested signifies too harsh a test, and that *Staphylococcus aureus*, although comparatively resistant, is by no means the only organism to be combated with

antiseptics. Nevertheless, recognition of *Staphylococcus aureus* as a frequent and sometimes dangerous invader of wounds and of the existence of strains of standardized resistance not only justifies but clearly dictates its use as a test organism for a toxicity method of this kind.

#### SUMMARY

Using the destruction of phagocytic activity as a measurement of toxicity and comparing toxicity with germicidal ability under a similar set of conditions to obtain a toxicity index, it was found that the addition of alcohol to a solution of phenol increased the toxicity index. A very marked increase in the toxicity index occurred when soap was added to phenol solutions. The relatively high toxicity index caused by the addition of soap was demonstrated with several phenolic compounds and essential oils. The toxicity of alcohol and soap was obtained for comparison. The toxicity and germicidal power of

87 commercial mouthwashes have been determined. Only 9 of the 87 mouthwashes tested were found to be germicidal under the conditions of test, while 62 were toxic in a 1:5 dilution; 14 were toxic in a 1:10 dilution; 2 were toxic in a 1:15 dilution; 5 were toxic in a 1:20 dilution, and one each was toxic at dilutions of 1:25, 1:30, 1:40 and 1:50.

A brief discussion of the application of the toxicity-index method to the evaluation of antiseptics is presented.

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## Neighborhood Health

WE note with great reluctance the discontinuance for an indefinite period of *Neighborhood Health*, a publication issued by the Department of Health of the City of New York. The Department is dropping this periodical as a part of its program to concentrate all its efforts on the most indispensable public health services during the war.

We are sure that many readers of *Neighborhood Health* will miss this thoroughly instructive and enjoyable publication. The final issue was devoted to a compilation of popularized information on nutrition and was an excellent "swan song" for this valuable periodical.

—From copy prepared for "Credit Lines"—  
more on pages 317-322.

# An Improved Non-Virulent Rabies Vaccine\*

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A NON-VIRULENT rabies vaccine has been developed and tested in our laboratory with results which warrant its trial by others both in the laboratory and in the field.

The vaccine is prepared in the following manner: Two months old beagle dogs are injected intracerebrally with mouse brain rabies virus, Pasteur strain. When the animals are prostrate, their brains are removed, weighed, triturated, and diluted with buffered distilled water to make a 5 per cent emulsion. This emulsion is then centrifugalized at 500 r.p.m. for 5 minutes and the supernatant removed. This supernatant, to immunize, must titer at least 330,000 mouse doses per ml. and be relatively free of large particles. It is then rendered non-virulent by exposure to ultra-violet light for 35 minutes. Tests for sterility are made and the vaccine is then ready for use.

This vaccine has been submitted to four types of test, each of which will now be summarized.

Our intracerebral test<sup>1</sup> was first employed with modifications designed to reduce both the amount of vaccine and the number of doses required. Three intraperitoneal doses each of 0.03 ml. of vaccine immunized mice effectively.

This is the smallest total amount and fewest doses of vaccine yet found effective against a subsequent intracerebral injection.

To permit a comparison of irradiated vaccine with others designed for human treatment, commercial phenolized and chloroformized vaccines and our irradiated vaccine were diluted as previously described.<sup>1</sup>

The dilution of vaccine eliminates the effect of phenol and chloroform.

The irradiated vaccine protected mice against 10,000 lethal doses and the

TABLE 1

*Immunity of Vaccinated Mice to Rabies Virus Injected Intracerebrally*

Mouse Group	Fate of Mice Given Test Virus in Dilutions					Titer	Amount of Protection in Intracerebral Lethal Doses
	10 <sup>-2</sup>	10 <sup>-1</sup>	10 <sup>-2</sup>	10 <sup>-3</sup>	10 <sup>-4</sup>		
Controls	—	4/4*	6/6	4/6	1/6	10 <sup>-6</sup>	—
Irradiated vaccine	0/6	0/6	3/6	1/6	—	10 <sup>-3</sup>	1,000+

\* 4/4=4 mice died of 4 injected  
—=Dilution not tested

\* Read before the Laboratory Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 16, 1941.

chloroformized vaccine against 1,000; a widely advertised phenolized vaccine gave no protection.

TABLE 2

*Immunity of Vaccinated Mice to Rabies Virus Injected Intracerebrally*

Mouse Group	Fate of Mice Given Test Virus in Dilutions							Amount of Protection in Intracerebral Titer Lethal Doses	
	$10^{-2}$	$10^{-3}$	$10^{-4}$	$10^{-5}$	$10^{-6}$	$10^{-7}$	$10^{-8}$	Titer	Lethal Doses
Controls	—	—	6/6*	6/6	6/6	4/6	0/3	$10^{-7}$	—
Phenolized vaccine	4/6	6/6	4/6	5/6	6/6	—	—	$10^{-6}+$	-10
Chloroformized vaccine	3/6	3/6	4/6	0/5	0/6	—	—	$10^{-4}$	1,000
Irradiated vaccine	1/6	1/6	2/6	2/6	0/6	—	—	$10^{-3}$	10,000

\* 6/6=6 mice died of 6 injected

—=Dilution not tested

We designed the intramuscular test<sup>1</sup> for vaccines with too slight immunizing potency for detection by the intracerebral method. The test simulates natural conditions and permits critical testing of canine vaccines. A single injection of 0.1 ml. of irradiated vac-

cine is ample to immunize mice consistently against street virus injected intramuscularly.

A third type of test not previously described has been that of infection with virus followed by treatment with vaccine. Groups of mice are given 0.01 ml. of street virus in dilutions into the gastrocnemius muscle and vaccine injections are commenced 3 hours later. Non-vaccinated mice show incubation periods exceeding 14 days and numerous survivors. No phenolized vaccine has given a clear-cut protective effect; chloroformized vaccines occasionally show some. The irradiated vaccine, however, in 5 doses totaling 0.5 ml., prevents rabies in most instances.

TABLE 3

*Immunity of Vaccinated Mice to Rabies Virus Injected Intramuscularly*

Mouse Group	Fate of Mice Given Test Virus in Dilutions		
	1/10	1/40	1/160
Controls	6/7*	4/6	2/6
Irradiated—1%	0/6	0/6	0/6
Irradiated—2%	0/6	0/6	0/6
Irradiated—5%	0/6	0/6	0/6

\* 6/7=6 mice died of 7 injected

TABLE 4

*Immunity of Vaccinated Mice Previously Injected Intramuscularly with Rabies Virus*

Mice	Controls	Phenolized Vaccine	Chloroformized Vaccine	Irradiated Vaccine
Number tested	77	48	25	79
Number dead	39	18	8	4
Per cent dead	50	38	32	5

TABLE 5

*Immunity of Vaccinated Dogs to Rabies Virus Injected Intramuscularly*

Dogs	Controls	Phenolized Vaccine	Chloroformized Vaccine	Irradiated Vaccine
Number tested	162	62	52	59
Number dead	136	45	26	1
Per cent dead	84	72	50	1.7

The final experiments dealt with the immunizing effects of irradiated vaccine in dogs. For 3 years young beagle dogs have been tested for resistance to rabies by injecting early-passage street virus into the neck muscles. Of 162 unvaccinated dogs injected with virus, about 84 per cent died. Of 62 dogs given commercial phenolized vaccine 3 weeks prior to the test injection of virus, 72 per cent died. Of 52 given chloroformized vaccine, 50 per cent died. Of 35 given 30 to 40 ml. of irradiated vaccine in a single dose, all were protected save one; of 24 given 5 to 10 ml. of the vaccine concentrated 6 times, all were protected.

In summary, the experiments have shown that the irradiated rabies vaccine is superior to other vaccines now on the market for immunizing mice and dogs against rabies. The vaccine can be prepared within 7 days, released within another 7 days, is relatively free from brain tissue, and appears quite harmless. Finally, its potency and, indeed, the steps in its preparation can be checked quantitatively.

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# The Public Health Engineer in a Small County Health Unit\*

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PROBLEMS of personnel and personnel functions in the field of environmental sanitation are receiving increased attention from those interested in public health engineering. This interest is reflected in the discussions of fellow workers, in committee work of the American Public Health Association, and in current publications.

In reviewing some of the published material concerning this field of interest, it is evident that one of the major questions under discussion is whether it is practicable and desirable to use trained sanitary engineers for the environmental sanitation work in the smaller units of public health organization. In most cases, it has been generally accepted in theory, if not in fact, that the training of the public health engineer is the minimum preparation necessary to direct the sanitation activities properly in the larger administrative divisions. The acceptance of such a premise concerning the smaller units has not as yet taken place due largely to economic considerations. The rôle of the public health engineer in the smaller administrative units has been ably presented by others,<sup>1, 2, 3</sup> and need not be repeated here. Perhaps one of the reasons that economic considerations play such a strong part in decisions to use less well qualified personnel in the smaller administrative

units is the failure of officials to take the time to view in perspective the type of environmental sanitation program which will most effectively and positively influence the planning, design and building of a safe and healthful community.

The experience of seven rural county health departments in southwestern Michigan may, perhaps, throw some light on this question. To a certain extent these county units, coöperating in the Michigan Community Health Project, have unusual resources through the coöperation of the W. K. Kellogg Foundation. Nevertheless they are responsible for the customary public health program including environmental sanitation.

These rural areas have the usual problems of water supply, excreta disposal, milk and food supply, resort sanitation, school hygiene, housing, and those sanitation problems found in small industries.

When the health departments were first established, few of the public water supplies were satisfactorily protected. The percentage of bottled milk that was pasteurized was very low, and other protections usually considered as necessary to a healthful environment were correspondingly poor.

The first step in the approach to the solution of the problems of these counties was one of definition with all that this involves if intelligently done including inspections, tabulations, charts,

\* Read before the Conference of Municipal Public Health Engineers at the Seventieth Annual Meeting of the American Public Health Association in Atlantic City, N. J., October 13, 1941.

maps, and analysis of facts. Standards had to be agreed upon based on the pooled experience of qualified authorities and as translated into terms of the local situation.

Once defined, a properly qualified person not only applied his technical knowledge to the individual problems of pasteurization equipment, approval of plans for new or improvements to existing water supplies, etc., but he developed a plan of attack, with the approval of the health officer. Together they interpreted the problem to the officials and people of the community in a scientifically correct and forceful manner. Once the people of the community understood, for example, the benefits resulting from the use of a safe water supply and a safe milk supply, and once they understood the procedure necessary to obtain these services, and once the people who supply these services understood their responsibilities, then improvements came as day after night. Both the educational program and the technical program were scientifically sound and convincing.

There is no one way by which a person or a group of people can be influenced on a given subject. The program was directed by both the Health Officer and the engineer to the school board, the school teacher, and the school child; the local physician; the dairyman; the veterinarian; the milk plant owner; the local service club; the newspaperman; the camp to which the child goes; the parents; the motion pictures, etc. All of these factors and more may have a bearing, for example, on a person's attitude toward whether the milk served in the school is pasteurized or raw. A planned specific approach to a program of education directed at the proper points will yield dividends much more readily than a program that has not been properly defined nor adequately understood and accepted by the community. The program of the public

health engineer takes into consideration the driving forces that motivate the people he is dealing with.

In the campaign to improve the milk supply the health officer can usually obtain the coöperation of the medical and dental societies, the veterinarians' association, and others that are directly concerned, in the consideration of the scientific facts regarding the effect of pasteurization on milk and in the endorsement of the use of safe milk.

Furthermore, it is important to the progress of the program that the large consumers of milk demand a safe milk. It is important that the people who buy milk for schools, hospitals, camps, and restaurants, for sale or distribution to others buy safe milk. Health departments can influence most of the restaurants and resorts to want a safe milk supply and then should take the positive stand that all establishments must sell only milk that is properly pasteurized. A concentration of all the health department programs that affect milk must be achieved.

It is readily seen that the health officer with a public health engineer has open to him quite a different approach to the problems of environmental control from that of routine inspection of facilities in the field to determine whether sanitation standards are met or whether the law is being complied with.

What applies to the milk situation also applies to problems in connection with a municipal water supply.

For example, in securing the extension of water mains into certain areas of a municipality, that the village fathers in the past had decided could not be served, similar problems are presented. There may be in the area of the municipality eight families living on a street that have been told that the water mains cannot be extended to them because there are not enough connections to justify the first cost. They then have to construct their own water supplies

which may or may not be safe. Later, four more families build on the same street and want water from the municipality. Perhaps with the twelve families there are enough customers to justify the expense involved. But by this time the first eight families, who have spent considerable money to obtain their own supplies, will have nothing to do with the village water. Without question, such a situation requires a knowledge on the part of the public health engineer of the principles of water supply protection, but it also entails an understanding and the application of, let us say, community engineering of the highest caliber to secure the best solution. Such community engineering embraces the problem of securing the coöperation of the village fathers in a consideration of the economic and social problems involved as well as the public health problems. From such an understanding the village council may be expected to assume an attitude which will result in action.

Small semi-public water supplies present the same type of problem. The inspector goes to the school and finds that the well is driven within a few feet of the septic tank. It is obvious that all such dangerous conditions must be corrected, but it is far more important that, from that time on; no future improperly located or protected installations of such a nature be made. This means a positive preventive program, educational and coördinated in plan, for well drillers, plumbers, contractors, school authorities, and others who have a direct relationship with the problem. It is not enough to correct conditions that exist or to make inspections to see if accepted sanitation standards are met. The program, to be effective, must be a positive one to insure that all new work will be done properly. That can be accomplished only when the people who are doing it understand the basic principles of location, construction, and protection of wells, and the people who are having

it done understand the necessity for such procedures.

It is certainly desirable to have the school water supply protected, to have the restaurant clean, the milk supply safe, and to have proper and safe systems of excreta disposal. The public health engineer in a rural community has to find ways to make the people want to reach health objectives through their own interest and understanding of the problems.

When a field visit is being made the public health engineer is able to contribute effectively to the accomplishment of an educational goal. To record the number of field visits made, means little. It is most important that the contact be educational. The field forms should be such that the owner of the establishment can see what facilities are necessary and to understand why. It is to his benefit to know.

The office forms containing information secured in the field should be designed for use gradually to develop the community picture, to show needs, to show progress, and to assist in understanding problems and developing sound policies and programs.

It will be recognized that these same factors operate throughout the entire environmental sanitation program. The problems are community ones to be solved through the educational, social, and economic considerations as well as through the application of technical engineering principles. As a consequence, community hygiene plans and programs should be developed on the basis of active participation of the people and groups concerned. Proceeding on this line of reasoning it is apparent that trained individuals can accomplish the objectives much more effectively than can less well qualified personnel. The health officer is more likely to permit properly trained personnel to engage in a far-reaching educational and coördinated type of program which he feels is



basically sound than he will if he has to depend only on less well qualified personnel.

We believe that the fundamental differences between the value of the public health engineer and a less well qualified inspector are apparent when one visualizes such an attack on community sanitation problems.

The approach to these community environmental problems should be on a problem solving basis. First, comes the finding of the problem; second, comes the education of those directly concerned to see the problem; and third, comes the organization of the community resources to help solve the problem. Another way in which we like to think of the problem solving approach is the "what," "why," and "how."

In conclusion, it should be stated that the less well qualified inspector has a place at this time in the cities and larger units of public health organization when working under qualified engineering di-

rection. However, it is felt that the inspector and his program cannot be superimposed on a rural community without technical engineering supervision, unless the local department is willing to accept a less effective type of sanitation program. It appears to us in the Michigan Community Health Project that the public health engineer with his background of basic training which equips him to enlist and coördinate the community forces is a sounder investment to a small county health unit than a less well qualified inspector working independent of qualified engineering direction.

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# Carriers and Abortive Cases in a Rural Poliomyelitis Outbreak\*

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FOUR children in the Town of Knox, a rural area in Albany County, N. Y., became ill with severe paralytic poliomyelitis on the same day, September 10, 1940. A 5th similar case developed on the following day. Three of these cases occurred in one family.

No case of poliomyelitis had been reported previously in this sparsely populated community since 1922. Although only 5 paralyzed cases were observed, the morbidity rate among the 953 residents in the Town of Knox was 5.3 per 1,000, a rate for paralyzed cases comparable with those seen during the severest epidemics in urban areas.

The Town of Knox is located in a corner of Albany County bordering on Schenectady County. It consists of farms and one small hamlet of 25 to 30 houses. A paved road makes the town readily accessible to the cities of Schenectady and Albany, approximately 12 and 22 miles distant, respectively.

During the 2 months preceding the Knox outbreak, 17 poliomyelitis cases were reported in Albany and Schenectady Counties. Ten of these were in the city of Schenectady and its suburban areas, Rotterdam and Scotia. During the preceding decade, 1930 to 1939, only once had the incidence of poliomyelitis in Schenectady County

been higher than in 1940, and that was 9 years earlier in 1931. From 1936 to 1939 there had been only one case reported each year. Thus the Knox episode was preceded by a higher than normal prevalence of poliomyelitis in nearby areas.

## METHOD OF INVESTIGATION

Field and laboratory studies were inaugurated ‡ on September 16, the diagnosis in all 5 paralyzed patients having been confirmed by their clinical course and lumbar puncture findings.

With the assistance of a public health nurse, a household canvas was made in each home situated within an area of approximately two miles radius, centering about the 3 families in which paralytic poliomyelitis occurred. The survey was started on September 25 and completed on October 4. In each home a household roster was taken and notes were made of the history of any illness, no matter how slight, during the period September 1 to 24. All the symptoms commonly associated with abortive poliomyelitis were specifically mentioned. Individuals found to have had symptoms suspicious of this condition were checked by an orthopedic nurse trained in muscle grading. No undiscovered cases with paralysis were recognized.

Stool specimens for monkey inoculation were collected from the 5 paralytic

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TABLE 1

*Number of Persons Surveyed, Number of Persons with Acute Illness, and Attack Rates per 100 Persons, by Age and According to Association with Poliomyelitis Cases, Knox, N. Y., September 1-24, 1940*

Age	Total Persons Surveyed		Total Persons with Acute Illness		Attack Rates per 100 Persons Surveyed	
	Intimate Associates	Others	Intimate Associates	Others	Intimate Associates	Others
0-15 years	23	73	11	17	47.8	23.3
16 years and over	10	267	3	35	30.0	13.1
Total	33	340	14	52	34.6*	15.7*

\* Adjusted for age.

cases, from all of their household contacts, from a 4th family, intimately associated with one of the paralytic cases, in which suspicious illnesses had occurred, and from 8 other individuals in whom no contact was discovered. All specimens were collected between September 16 and October 5, the majority being taken from 2 to 3 weeks after the outbreak occurred.

These stool specimens were examined in the Division of Laboratories and Research of the New York State Health Department, by Dr. George Y. McClure. The technic used was a modification of the procedures developed by Trask, Vignec, and Paul (1938), and consisted of the intraperitoneal inoculation of rhesus monkeys with the stool specimen after treatment with ether and lauryl sulfate. Some of the monkeys were also given simultaneous intra-nasal inoculations. A detailed report of the

laboratory results is being published by McClure and Langmuir.

#### SURVEY OF ILLNESSES IN THE COMMUNITY

In addition to the paralyzed cases, a number of acute minor illnesses were discovered in the community. The number of individuals surveyed, the total persons with illnesses, and the attack rates, according to age and association with the poliomyelitis cases, are presented in Table 1. The 33 intimate associates consist of 20 household contacts of the paralytic cases, and 13 close friends of the family in which 3 paralyzed cases occurred. The age adjusted attack rate among the intimate associates is double the rate among the others in the community. This difference is of doubtful statistical significance due to the small number of intimate associates; however, the dif-

TABLE 2

*Classification of Types of Symptoms Reported in Survey of Acute Illnesses, Knox, N. Y., September 1-24, 1940*

<i>Upper Respiratory</i>	<i>Gastrointestinal</i>	<i>Nervous System</i>
Cold in head	Nausea	Pain in extremities
Coryza	Vomiting	Sciatica
Cough	Anorexia	Backache
Sneezing	Diarrhea	Headache
Sore throat	Pain in abdomen	Stiff neck
Ear ache	Gas on stomach	Dizziness
Tightness in chest		Drowsiness

ference is consistent both among the children and the adults.

The acute illnesses have been classified into 3 groups by symptoms referable to the upper respiratory, gastrointestinal, and central or peripheral nervous systems. The symptoms included in these 3 classifications are listed in Table 2.

The number of acute illnesses, by age and according to type of symptoms and association with poliomyelitis cases, is presented in Table 3. Although the numbers are quite small, rather striking difference in attack rates occurred, as shown in Table 4. The illnesses referable to the gastrointestinal and nervous system predominate among the intimate associates, while the upper respiratory illnesses are concentrated among the others in the community. As with the rates for total illnesses, the differences are of doubtful statistical significance, but they are fairly consistent for both children and adults.

#### LABORATORY FINDINGS AND CLINICAL OBSERVATIONS

A summary of the results of the examinations of the stool specimens is presented in Table 5. Four of the 5 paralytic cases were found to have poliomyelitis virus in their stools. In the 5th case, doubtful results were obtained which have been discussed in a special report by McClure (1941).

Thirteen of the 27 contacts from whom specimens were obtained gave a history of illness. The onset of symptoms in each of these cases occurred within the 10 day period, September 10 to 19, immediately following the outbreak. Of these 13 intimate contacts with illness, 10 (77 per cent) harbored poliomyelitis virus in their stools, and therefore, may have been unrecognized cases of poliomyelitis. Only 1 of these 10 individuals gave a history of fever which is the basic criterion set by Paul, Salinger, and Trask (1933) for the diagnosis of abortive poliomyelitis. This

TABLE 3

*Acute Illnesses, by Age and According to Type of Symptoms and Association with Poliomyelitis Cases, Knox, N. Y., September 1-24, 1940*

Age	Type of Symptoms					
	Upper Respiratory		Gastrointestinal		Nervous System	
	Intimate Associates	Others	Intimate Associates	Others	Intimate Associates	Others
0-15 years	2	12	8	3	2	6
16 years and over	..	29	1	10	2	7
Total illnesses *	2	41	9	13	4	13

\* Fourteen of 66 persons ill had symptoms referable to two or more types.

TABLE 4

*Attack Rates per 100 Persons from Acute Illnesses, by Age, and According to Type of Symptoms and Association with Poliomyelitis Cases, Knox, N. Y., September 1-24, 1940*

Age	Type of Symptoms					
	Upper Respiratory		Gastrointestinal		Nervous System	
	Intimate Associates	Others	Intimate Associates	Others	Intimate Associates	Others
0-15 years	8.7	16.4	34.8	4.1	8.7	8.2
16 years and over	....	10.9	10.0	3.7	20.0	2.6

TABLE 5

*Results of Examination of Fecal Specimens,  
Knox Poliomyelitis Outbreak September  
1-24, 1940*

<i>Type of Person Examined</i>	<i>Number Examined</i>	<i>Number Positive</i>	<i>Per cent Positive</i>
Paralytic cases	5	4	80.0
Intimate contacts:	27	20	74.1
with illness	13	10	76.9
without illness	14	10	71.4

patient, a 3 year old girl, had an acute febrile episode with vomiting and malaise. A physician saw her three times but failed to find stiff neck or evidence of muscular weakness. Four other children had mild stomach upsets with vomiting and abdominal pain about which their mother was wholly unconcerned. Two children had mild upper respiratory symptoms, which did not confine them to bed. The remaining 3, 2 children and 1 adult, had symptoms suggesting involvement of the peripheral or central nervous system. The first, a 13 year old girl, had pain in the knees and backache for one day, but she remained in school. The 2nd, a 10 year old boy, had headache, pain in the eyes, dizziness, and soreness in the chest and abdomen. He was out of school for 2 days but his mother denied that he had had fever. The 3rd, a 43 year old man, developed a severe sciatica which necessitated a visit from a physician on September 14. Although the information available on this case is limited, it suggests the polyneuritic form of poliomyelitis described by Wickman (1913).

Of the 3 intimate contacts with illness who had negative stools, 1 adult complained of "gas on the stomach" for one day, another had headache and anorexia, and 1 child had a mild stomach upset with vomiting.

Among the 14 intimate contacts who remained well during the period of observation, 10 (71.4 per cent) were carriers. Out of the total group of 27

intimate contacts, 4 of the 8 adults and 16 of the 19 children harbored the virus at some time.

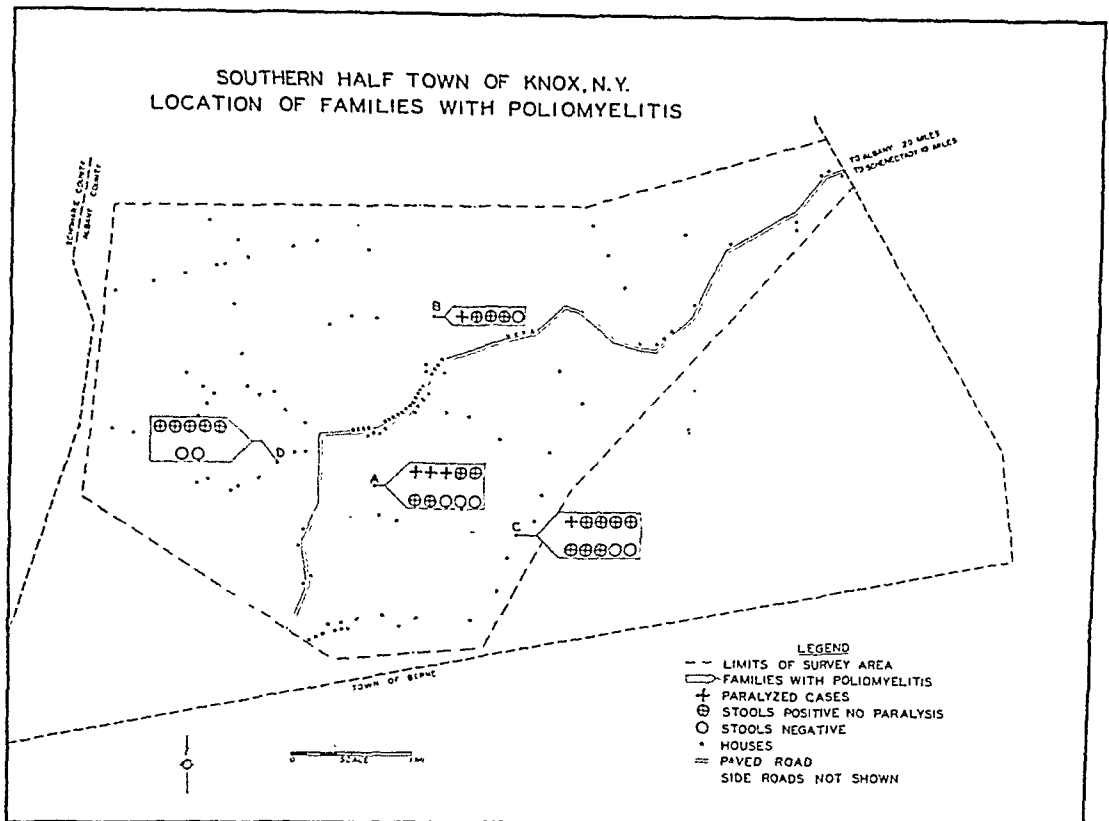
It has been mentioned that 8 specimens were secured from individuals without known contact with any of the paralytic cases. Four of these specimens were from persons in the community who gave histories of previous attacks of poliomyelitis at least 5 years prior to the present outbreak. The 4 other stools were from the members of a family in which 1 child had a febrile illness with vomiting and pain in the abdomen lasting for 2 days. In none of these 8 specimens was the virus found. This group of 8 individuals does not represent a fair sample of the community at large, but the consistently negative results do serve as a check on the validity of the laboratory methods used.

#### SOURCE OF INFECTION

The chronological and geographical concentration of cases suggests that some unusual characteristics might be discovered in the community or in the activities of the 4 families in which poliomyelitis occurred. The accompanying map shows the location of these 4 families A, B, C, and D, and the distribution of the homes in the area.

Each of the 4 families maintains its own cow, each has a shallow dug well, unprotected from surface pollution, and each has an unscreened surface privy. Although 3 of these 4 families live in extreme poverty, the total lack of improved sanitary facilities is characteristic of the farms throughout the community.

A majority of the population live by farming. A few individuals commute to Schenectady and a small number of city dwellers maintain summer residences. The community is typical of many marginal farming areas throughout New York State, and is quite similar in its sanitary environment to the rural



areas described by Frost (1913) in his studies on poliomyelitis in Iowa.

Three of the 4 families, A, B, and D, are intimately associated. Families A and B, in which 4 of the 5 paralytic cases occurred, are related. The children in all 3 families are regular playmates. Family A and B held a joint party 8 days prior to the outbreak on the A farm. Two days before their onset, the younger children from the A farm visited over the weekend with both family B and family D.

Family C was acquainted but not closely associated with the other 3 families. However, 9 days prior to the onset of the 1 paralytic case in family C, the patient was exposed at a large family party to a number of relatives from Schenectady and Rotterdam.

Only 2 of the members of the 4 infected families had regular contacts outside of the town. The father in family A drove through Schenectady daily on his way to work as a laborer on a construction gang. However, his stool

specimen was not found to contain virus at the time it was examined. The oldest boy in the same family worked throughout the summer at a tea shop in the hamlet where he had casual contact with residents from Schenectady, Albany, and other areas. His stool was positive. None of the members of family C had known contact with either of these individuals for at least 25 days prior to the outbreak, but they were exposed to a large number of persons resident in an area where poliomyelitis was prevalent.

Although no direct or indirect contact between any of the known cases in Schenectady or Albany and the 4 infected families in Knox was discovered, the general character of the community, and the ready accessibility of large urban areas give ample opportunity for a variety of contacts of which no knowledge could be obtained. Therefore, the means of introduction of the infection into the community is obscure, but several possibilities are evident.

Although the explosiveness of the outbreak suggests a common source, none was discovered. To be sure, 3 of the families A, B, and D, were intimately associated but all the members of these 3 households were not known to have been together at any one time, nor was it found that they all partook of the same water, food, or milk at any time. None of the members of family C had visited at any of the other 3 farms for several months prior to the outbreak. In spite of investigation among the members of all 4 households, no evidence of a common source of infection for all the cases could be obtained.

The possibility of an insect vector as the means of transmission of the disease has been considered. House flies and other common insects were present in abundance throughout the area. There was a moderate prevalence of mosquitoes of both the anopheline and culicine varieties. However, the location of the 4 families on isolated farms surrounding but not within the relatively concentrated area of the hamlet does not favor an insect vector, although this possibility cannot be entirely ruled out.

Consequently, personal contact among intimate friends and members of each family is the most adequate explanation for the known infections within the community. All the members in 3 of the families A, B, and D were closely associated and intimately exposed to at least one of the paralytic cases within 2 days prior to the onset of the outbreak. The 4th family was exposed throughout 1 day to residents in an area where poliomyelitis was prevalent. The higher attack rate for acute minor illnesses among the intimate associates is confirmatory evidence supporting the contact hypothesis.

#### DISCUSSION

That contacts of cases of poliomyelitis may harbor the virus in their stools has been shown repeatedly by Trask,

Vignec, and Paul (1938); Lepine, Sedallian, and Sautter (1939); and Kramer, Gilliam, and Molner (1939). The present study indicates the extent to which carriers and unrecognized cases may develop among the intimate contacts of paralytic cases in a rural community in which a previous case had not been reported for 19 years. Out of the group of 27 contacts examined, 84.5 per cent of the children under 19 years of age and 50 per cent of the adults were carriers. Half of the contacts remained well. Only one of them had sufficient symptoms to meet commonly accepted criteria for typical abortive poliomyelitis. Thus a variety of symptoms must be considered to be suspicious and of these gastrointestinal symptoms appear to be more suggestive than respiratory. But in this series it has been impossible to differentiate clinically between cases with and without virus in their stools.

Spread of infection through personal contact appears to be the most reasonable hypothesis by which to account for this outbreak. The high proportion of individuals shown to harbor the virus must have offered many opportunities for spread from person to person, both among children and adults. But the finding of virus in the feces by no means implies that the disease was transmitted by water, milk, or food contaminated with such discharges.

The extent to which the infection was present throughout the community was not determined. It may have spread widely without attracting notice, in view of the mildness of the symptoms in the unrecognized cases and the large proportion of carriers observed among the contacts.

Further studies are indicated in which fecal specimens are taken from members of the general population as well as from cases and household contacts. It is reasonable to suppose that such studies would provide laboratory con-

firmation of previously held beliefs as to the wide distribution of poliomyelitis virus during an epidemic, and as to the rôle of unrecognized cases and carriers in its transmission.

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# New Methods of Hookworm Disease Investigation and Control\*

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THE studies of Keller, Leathers, and their associates<sup>1</sup> clearly show a marked reduction in the recent incidence and, presumably, in the intensity of hookworm infection in the southern states in contrast to the conditions prevailing in 1910-1914 as revealed by the Rockefeller Sanitary Commission. Nevertheless, hookworm disease remains a source of physical disability and economic handicap in certain parts of several states, and considerable amounts of time and money are currently expended by state and local health agencies in its reduction.

Curiously enough, however, the worldwide researches of the last twenty years on the quantitative aspects of hookworm infection have apparently failed to make an effective impact on state and local health authorities. Indeed, the problem is viewed by them almost without exception as a qualitative one. It is taken for granted that hookworm infection is tantamount to hookworm disease. Egg-positive individuals are discovered by annual flotation surveys of school children. The positives are given, or are urged to take, anthelmintic treatment with little regard to their clinical condition, the relative magnitude of their worm burdens, or the probability of prompt reinfection. The only truly preventive values inci-

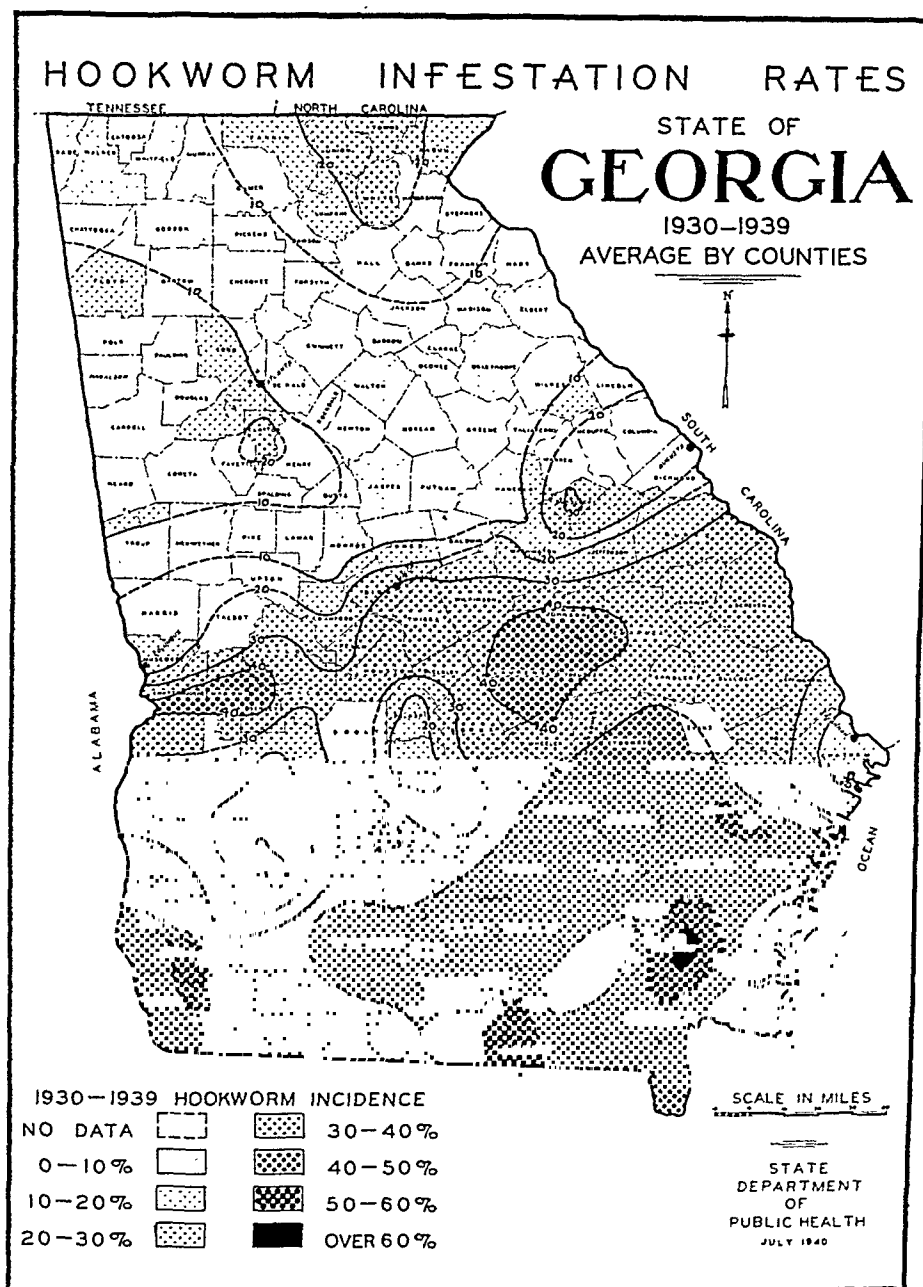
dental to these efforts are when the incidence information is used in the promotion of sanitary excreta disposal facilities at homes and in schools. Thus, these anti-hookworm programs involve the special interests and activities of laboratory, epidemiologic, engineering, nursing, and local health administrative services, but these frequently are not coordinated because the program lacks a guiding plan or specific direction. Much of the work, therefore, is repetitious, unnecessary, and wasteful.

In an attempt to develop a sound anti-hookworm program that could be effectively and conveniently carried on by local health agencies and to assist in its promotion and effectuation in Georgia, the State Department of Public Health established a Hookworm Service unit late in 1939. Personnel includes a nurse and a sanitarian who give their entire time to this project, and a medical epidemiologist and a director (parasitologist) who devote about half their efforts to anti-hookworm activities.

All requests from local lay or health sources for hookworm surveys must be approved by the director before survey materials are supplied. Thus, he is in position to prevent pointless surveys with their wasteful expenditures of time and materials; he frequently can convert the desire to "do something about hookworms" into a more effective procedure than a flotation survey of school children; and, lastly, he can

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FIGURE 1



regulate and equalize the laboratory load of hookworm examinations to a very considerable degree.

The first step toward a refinement of existing knowledge of the hookworm problem in Georgia consisted of tabulating, by year and county, the previous 10 years' incidences of hookworm infection as determined by flotation surveys. The county rates for this period were then used in developing an isoropic map (Figure 1) showing the

state-wide distribution of various classes of hookworm incidence. This provided a useful though not statistically or parasitologically ideal basis on which to plan subsequent investigations.

The next step was to substitute, in the minds of local health personnel, quantitative for qualitative concepts regarding hookworm infection. This was done by keynoting the subject at state and regional health meetings and by making it the topic of discussion be-

fore in-service training groups. The following argument was developed.

1. Adult hookworms suck blood continuously, the amount removed being proportional to the number of worms present.
2. If they remove blood more rapidly than it can be formed, hookworm disease, or anemia, results; if not, the condition is one of subclinical hookworm infection.
3. The primary objective of public health authorities should be the detection, prevention, and control of hookworm disease rather than the elimination of subclinical hookworm infection.
4. Inasmuch as the rate of blood removal by hookworms varies directly with the number present and the rate of hemoglobin formation is normally governed by iron and protein intake, it follows that
  - a. Hookworm disease is more likely to occur and will be more severe when worm burdens are high and iron-protein consumption low.
  - b. When adequate iron-protein consumption prevails, hookworm infection, with rare exceptions, will be subclinical, whether worm burdens are heavy or light.<sup>2</sup>
  - c. When diets are iron-protein deficient, a chronic, progressive anemia will develop irrespective of whether hookworms are present or absent.<sup>3</sup>
  - d. Even in hookworm infested areas, therefore, all instances of anemia are not necessarily cases of hookworm disease. Intelligently planned hookworm disease control must distinguish between anemias caused or augmented by hookworms and those due to other causes.
5. To accomplish the control of hookworm disease, knowledge of the intensity as well as the incidence of hookworm infection must be available and this must be considered in relation to the apparent anemia and dietary habits of the people concerned.

The third step was the development of a practical program of investigation and control based on this quantitative viewpoint and available epidemiologic knowledge. It was aimed (1) as the destruction of the greatest possible number of hookworms with the least expenditure of time, travel, and materials,

(2) the prompt physical rehabilitation of those sick with hookworm disease, and (3) the prevention of further hookworm infection.

The epidemiologic facts utilized, and their implications, are as follows:

1. Hookworm disease does not occur where approved domestic and school excreta disposal facilities are in use. Thus sanitary sewerage or privied sections generally may be dismissed from consideration.
2. Assuming favorable temperature and moisture conditions, hookworm larvae develop best in sandy or sandy-loam soil.<sup>4, 5</sup> Strictly clay regions should not be included in the area of examination.
3. Hookworm disease is rarely, if ever, a health problem in Negroes.<sup>1</sup> Thus Negroes may be omitted from investigation.
4. Hookworm disease is predominantly a disease of low-income families. It is, therefore, usually unnecessary to investigate well-to-do families.
5. The findings of Keller and Leathers and their collaborators<sup>1</sup> have focused attention on the family or household group, rather than the individual, as the important unit of hookworm dissemination in the southern United States. Hookworm investigation and control, therefore, should be prosecuted on a family instead of an individual basis.
6. The same investigators have shown that the average individual worm burden tends to increase with the number of infected members in the family. This indicates the greater probability of finding hookworm disease in large rather than small families.

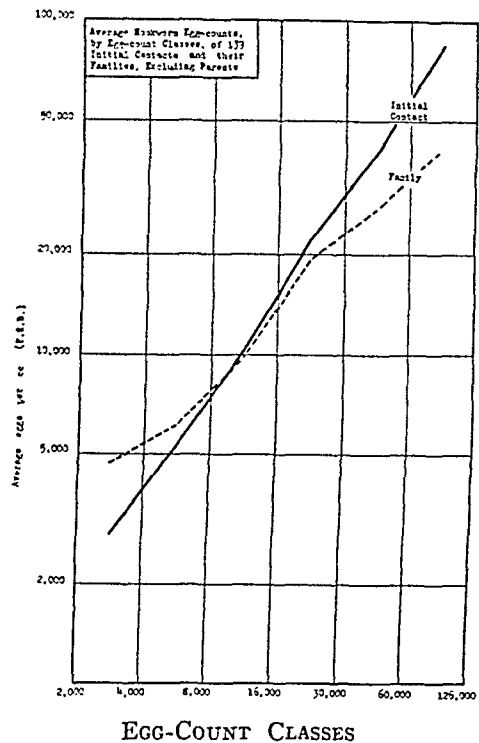
Summarizing the above, it is apparent that, if investigation is restricted to large, white, low-income families living on sandy or sandy-loam soil without sanitary excreta disposal facilities and in which clinical anemia is evident, the majority of the cases of hookworm disease in the area will be encountered.

In apprehending these families, two procedures are in use in Georgia. Where soils, family incomes, races, and domestic sanitation vary widely within a county, direct home visiting without preliminary survey is planned on the basis of soil maps, sanitary survey

maps, and information obtained from welfare agents, county agents, Farm Security representatives, home demonstration agents, physicians, and others whose business takes them into rural homes. Fecal specimens from one or more anemic members of each family, under 20 years of age, are sent to the State Health Department Laboratory and these are examined by brine flotation. Those found positive are egg-counted by the small-drop dilution method of Stoll and Hausheer<sup>7</sup> to obtain some indication of the relative intensity of infection and the corresponding probability that the anemia observed is due to hookworms.

In counties where sandy soils, poverty, and insanitation predominate, home visiting is deferred until the selective school survey has directed attention to families of probable hookworm significance. This is done by distributing fecal containers only to those white school children who show evidence of being anemic. School teachers are invited to assist in the selection because they are able to make their judgments on the basis of activity as well as appearance and because it gives them definite responsibility in connection with this special health program. These specimens are examined in the State Health Department Laboratories first

FIGURE 2



by flotation to eliminate negatives, the positives being egg-counted.

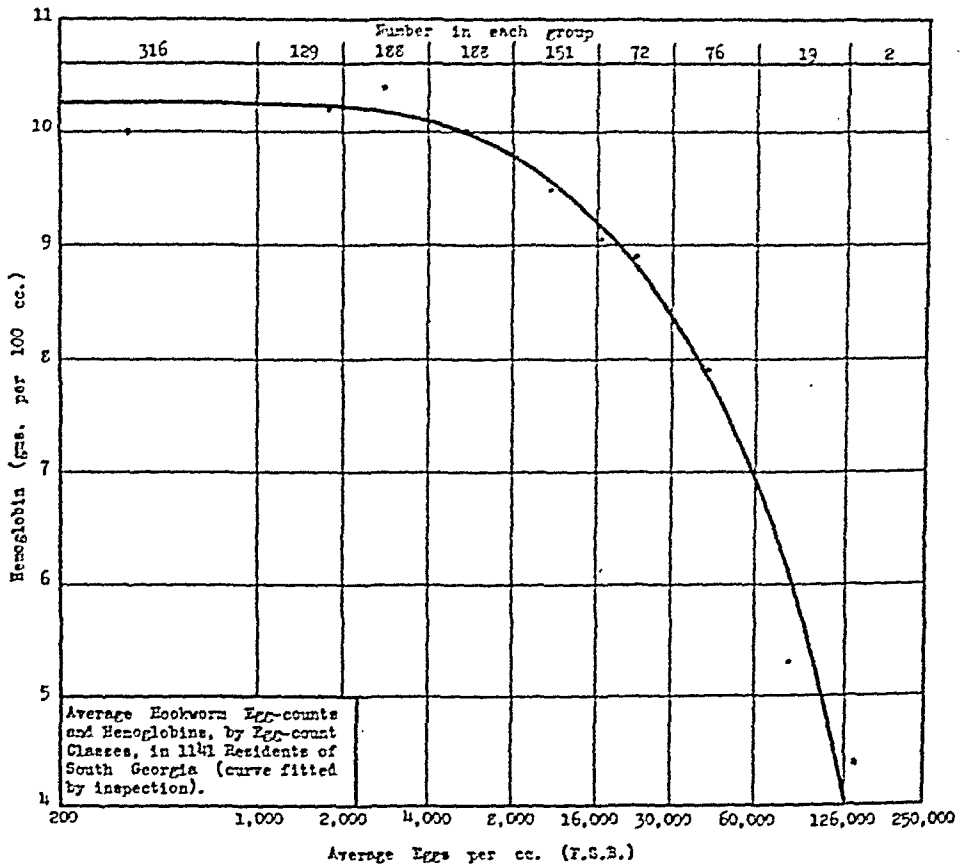
During the development stages of this program, we urged examination of all members of the suspected families. This turned out to be impractical because of non-coöperation, especially of adult males, and the time and travel consumed in repeated visits to the home. This procedure has been abandoned as we presently discovered that in general

TABLE 1

*Comparison of Average Egg-counts per ml. of Formed Stool, by Egg-count Classes, of Initial Family Contacts and All Members of Their Families, Excluding Parents*

Hookworm Egg-Count Class	Families, Including Initial Contacts, Excluding Parents						
	Initial Contacts		Number of Members				Average Egg-Count of Positives
	Number Examined	Average Egg-Count	Total	Average	Positive	5,000 or More Eggs per Ml.	
2,000- 4,000	25	2,868	110	4.4	76%	18%	4,692
4,000- 8,000	36	5,419	150	4.2	79%	39%	6,225
8,000- 16,000	28	10,696	104	3.7	92%	60%	9,715
16,000- 30,000	21	22,400	91	4.3	96%	74%	18,607
30,000- 60,000	21	41,181	77	3.7	94%	83%	27,468
60,000-125,000	8	84,550	29	3.6	97%	97%	41,646
Totals	139	18,030	561	4.0	86%	53%	14,080

FIGURE 3



the egg-count of the initial contact, *i.e.*, the first anemic member of the family seen, under 20 years of age, was roughly representative of the average intensity of infection of all positive members of the family under 20 years of age, in which age group most cases of hookworm disease occur in this state. A comparison of average egg-counts of initial contacts and all members of the families is shown for 139 families in Table 1 and Figure 2. Accordingly, we have discontinued routine examination of other members of the family at great saving for both laboratory and local health services.

Similarly, we at first recommended control follow-up of families of anemic individuals with counts of 2,000 or more eggs per ml. of formed stool. This level was selected, more or less arbitrarily, before the results of our own county-wide surveys became available. It allowed a reasonable margin of safety below the egg-count level (2,600 eggs

per ml.) at which Smillie and Augustine<sup>9</sup> noted minimal symptoms of hookworm disease in Alabama. Our own observations,<sup>10</sup> shown in Figure 3, on the relation between egg-counts and hemoglobin determinations (Sahli) convinced us that it was pointless in Georgia to attempt control in families where the average egg-count was much below 6,000 eggs per ml. This corresponds in Figure 2 to an average egg-count of 5,000 eggs per ml. in initial contacts. Accordingly, local health personnel are now advised to select for control follow-up families of anemic individuals under 20 years of age whose egg-counts are 5,000 or more eggs per ml.

The families selected by either of these methods do not, of course, include *all* the cases of hookworm disease in the area. If faithfully carried out, however, these procedures, with a minimum expenditure of time, travel, and materials, will direct attention to the

bulk of the true hookworm morbidity, excluding that much larger group with hookworms but no hookworm disease. Attempts to eliminate hookworm from the latter group serve no useful health purpose, with the possible exception of promotion, a purpose which should be served better by an actual rather than a fictitious health problem. Nevertheless, knowledge of these families, members of which are suffering from anemia not due to hookworms, is of health significance as it is generally found that these persons are undernourished with respect to iron. Dietary anemia in Georgia, and apparently in Florida as well,<sup>3</sup> is more prevalent than hookworm disease with which it frequently and perhaps always occurs. This health problem can be economically attacked along with hookworm disease control; indeed, the two health activities effectively complement each other.

What is to be done for these hookworm diseased families once they are identified? First of all, their sick members must be made well. This requires medical service and, as far as possible, is handled by private physicians in Georgia. Indigency is high, however, among hookworm sufferers and it is usually the expressed desire of local medical groups or practitioners that health doctors assume treatment responsibilities for such patients. Anthelmintic drugs are supplied gratis to medical men by the state.

The therapeutic problem is a dual one consisting of worm removal and treatment of the anemia. As Payne and Payne<sup>11</sup> have recently shown, hemoglobin recovery following worm expulsion without iron therapy is a long drawn out process. This is especially true when dietaries are iron deficient.<sup>10</sup> On the other hand, while iron administration alone produces rapid improvement in the blood picture, the gains are not sustained unless the worms are removed. So we do both, giving iron,

usually as Bland's pills, *before* deworming if the anemia is exceptionally severe, *i.e.*, 5 gm. or less; *after* worm removal if the anemia is moderate. Educational efforts are made, thereafter, to improve the dietary so that greater iron intake in food is provided, especially for growing children in which the concurrence of hookworm anemia and nutritional anemia is most marked.

The prevention of hookworm disease is, first of all, a matter of sanitation, *i.e.*, the provision of approved excreta disposal facilities, second, education concerning their use and the physical benefits that will result therefrom and, probably, of improved dietary as well if the immunity hypothesis of Cort and Otto<sup>2</sup> based on observations of experimental dog hookworm infection is verified in man.

We, therefore, vigorously promote the sale and use of sanitary sewage disposal structures in homes and schools, but in these days of progressively restricted WPA participation in community sanitation projects, of increasing cost and decreasing availability of materials and of labor, the prospects of seriously interfering with the transmission of hookworms by the use of standard sanitary units are comparatively remote. Families that cannot afford minimal medical service cannot afford pit privies.

In those numerous instances, therefore, in which home sanitation cannot be provided, we are trying to develop definitely preventive values from anthelmintic treatment. As indicated above, individuals suffering from hookworm anemia are treated as fast as they are discovered, irrespective of whether or not the premises are to be sanitized. The deworming of other members of the family at that time is not encouraged. If a pit privy is provided and used, there will be no material increase in the intensity of infection and so family treatment is not necessary.

If, however, the household must get along without sanitary facilities, at least one and desirably two worm-removal treatments are urged for all members of the family during the cold months of the year. The object here is to reduce—and, if possible, to eliminate—the family worm burden at a time when immediate reinfection of its members from each other is less likely than it is during the summer months. The unfavorable effect on non-parasitic stages of hookworms of temperatures below 50° F. has been noted by various observers. Augustine,<sup>6</sup> working in southern Alabama, was unable to find larvae in polluted soil from the latter part of December into March. Our own findings in south Georgia, incomplete and inconclusive, confirm this observation. Thus it appears that the soil in this area tends to become free from infective larvae during the winter months and the likelihood of reinfection following treatment at this season is correspondingly remote. This seasonal prophylactic effect is enhanced by the fact that it is during the cold months of the year that rural residents wear shoes if they ever wear them at all.

Two treatments with tetrachlorethylene completely remove worms from about 90 per cent of the patients and reduce the group egg output by 99 per cent.<sup>12</sup> If these are given during the winter to all members of families in which hookworm disease has occurred, it seems improbable that hookworm infection could build itself up to clinical

intensities in those families within several years.

This program has not yet experienced the test of time. It is subject to improvement as further field investigations suggest. Nevertheless, we feel that through it we are accomplishing better hookworm control at a lower cost than we did before its development.

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# Methods of Production and Control of Normal Human Plasma and Serum \*

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UNDER certain circumstances clinical conditions occur which demand the prompt restoration of blood volume. Such conditions prevail particularly following shock, hemorrhage, and burns. Both laboratory and clinical investigations have shown that such volume replenishment can be accomplished adequately by whole blood transfusions, or the intravenous administration of either normal human plasma or serum. The widespread use of the last two substances has opened up a new field of biologic production and control. The present discussion is not concerned with the clinical value or use of these products, but rather with the mechanics of production and methods of safeguarding both the donor and the recipient.

## SOURCE OF SUPPLY OF THE RAW PRODUCT

Heretofore in the production of biologic preparations containing blood the source of supply has been the horse or some other domesticated animal. This has enabled the producing laboratory to keep its source of supply within the limits of the laboratory itself and without regard to the wishes of the donor. With human plasma or serum such an arrangement is obviously impossible. The producing laboratory is forced to search out the potential donor and by some arrangement,

mutually agreeable to all parties involved, arrange for the contribution of a specified amount of blood. How this can best be accomplished depends in a large measure upon the function of the producing laboratory. If it exists as a charitable or community enterprise, it can obtain donors in the following ways:

1. Volunteer donors who come as friends of the laboratory or the community. Such a donor service can best be maintained if it is incorporated into the program of one or more public spirited organizations as, for example, the Red Cross, American Legion, church organizations, Community Chest, lodge, or one of the Service clubs.

2. Volunteer donors provided by the patient from members of his family or friends. In order to give the patient prompt treatment he is treated with material drawn from the reserve supply. The bleedings which he provides in return are contributed later on schedule at the laboratory and these serve to replenish the reserve stock on hand.

A laboratory which obtains its supply of blood through such volunteer services must either have an adequate independent budget to meet its operating costs or must charge each recipient a service fee. Those who cannot afford to pay such a fee should be required to make payment in the form of a specified number of additional donors whenever possible.

As will be stressed later, the operation of a human blood processing laboratory is an exacting task and requires ade-

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quate equipment and well trained, full-time personnel who are responsible only to the director of the laboratory. In order to operate on a sound economic basis, the laboratory must serve a certain minimum territory. Because of these essential requirements, it may be more expedient for a community or hospital to contract with a qualified private laboratory for the processing and control testing on a unit basis. This can be accomplished only if the community or hospital is prepared to furnish the raw product either with or without charge. Economically, such an arrangement is probably less of a burden since the minimum trained personnel and the minimum equipment needed to process even a single unit can process many times the minimum by full utilization of its facilities. There is also the advantage that a privately operated laboratory can ignore institutional and political boundary limitations. An aggressive laboratory director can, therefore, range farther afield and render service to several communities or institutions and proportionately reduce the processing cost per unit. Under such a scheme the financial arrangement between the processing laboratory and each participating unit can be: (a) the raw product plus a unit price for processing with all of the finished product returned to the community of its origin; or (b) the raw product plus a sufficient added amount of the raw product which the processing laboratory shall be free to process and sell in the open market. The latter arrangement will take care of the community which is economically poor, but which can, on the basis of civic interest, obtain bleedings from its members.

There still remains a demand which cannot be met by either of the above plans. This consists of the scattered demand from individual sources which for one reason or another are not eligible for one of the above mentioned supplies.

Providing such a supply is the logical function of a private laboratory. It must buy the whole blood needed for processing for cash from individuals who are willing to sell their blood for a price. The extent to which such a laboratory can operate is limited since no community can supply much blood beyond its own needs and under present operating conditions no laboratory is permitted to go very far afield for its raw supply.

#### MINIMUM REQUIREMENTS FOR BLOOD PRODUCTS

Irrespective of the method of procuring the raw supply, the physical requirements for the donor, the method of taking the blood, and the operation of the processing laboratory must meet certain very definite standards. Laboratories operating entirely within the borders of a single state need only comply with the state regulations. On the other hand, if the operations become interstate in character, the processing becomes subject to the federal Biologics Act since human blood plasma and serum are by definition biologics. Because of the potential dangers both to the donor and recipient, the U. S. Public Health Service has recognized the need of surrounding the processing of human blood products with very specific restrictions. It is sufficient for this discussion to itemize the points covered by these minimum requirements<sup>1</sup>:

1. The donor must be in such physical condition that the taking of 500 ml. of blood will not endanger his health.

2. The donor must be free from any disease transmissible by blood transfusion.

3. The bleeding must be done in an adequately equipped bleeding center which shall at the time be under the control of the licensed laboratory.

4. The bleeding shall be under the immediate supervision of a qualified doctor of medicine, assisted by the necessary trained personnel.

5. The bleeding and all the subsequent steps

involving the blood fraction, until it is injected into the recipient, must be carried out in a closed system.

6. The drawn blood must be placed at 5° C. within 1 hour of bleeding, must be freed of its cells within 72 hours, and if the plasma or serum is to be held in the frozen state or be desiccated, it must be brought to the frozen state within 72 hours.

7. The product from a minimum of 8 bleedings must be pooled and well mixed before filling the final containers in order to dilute the iso-agglutinins adequately and also to equalize the protein content.

8. The product must be sterile as determined by sterility tests made: (a) on the plasma or serum from each individual bleeding or from a sample withdrawn from the pool before the addition of the preservative, and (b) on a specified number of finished containers. Animal safety tests are also made.

9. If the final product is retained in the liquid or the frozen state, it must be placed in a container made of good quality glass, stoppered with a collar type rubber stopper which will permit the entrance of the necessary needles or trochar for administration to the recipient, and the container must be properly labeled.

10. If the final product is processed to the dried state, the finished product must contain not more than 1 per cent of moisture as determined by drying over  $P_2O_5$ , the container must be flame sealed or its equivalent under vacuum in a container of good quality glass and so constructed as to permit the vacuum to draw the diluent into the container, thereby permitting solution of the dried product from the vacuum state.

11. Explicit instructions for the solution of the dried product and for the administration of the liquid material should accompany each package. The user should also be cautioned against overheating the product before administration and also as to the imperative need of using a filter in the lumen of the tube leading to the recipient's vein for the removal of particles dangerous for transfusion.

12. There are other refinements in technic of preparation, assembling, and administration which are being observed by the various producing laboratories. These are not included in the minimum requirements, but do add to the quality of the product and to the simplification of the administration.

serum is to be processed depends primarily upon the degree of stabilization of the component parts desired, upon the storage facilities available, and upon the interval likely to elapse before use.

1. *Liquid plasma or serum*—The preparation of liquid plasma or serum is the most economical both as to equipment needs and production time. Neither preparation is entirely stable since denaturation of the proteins gradually takes place when the product is held in the liquid state. The dissolved fibrin in freshly prepared plasma gradually precipitates with aging, giving serum plus a fibrin clot which must be filtered out before introduction into the recipient's blood stream. The precipitation of the fibrin may be greatly delayed by adding 10 per cent of dextrose to the plasma and avoiding storage at low temperatures. Serum may be stored at 2 to 5° C., whereas plasma should be stored at 15 to 30° C. Where production is for local consumption, and where administration is planned within 1 year, liquid plasma or serum is suitable. On the basis of production costs it is the product of choice.

2. *Frozen plasma or serum*—It has been shown that plasma or serum can be reduced by quick shell freezing to the frozen state without causing any significant alteration in the physical or chemical characteristics of the component parts. Similarly, if it is returned to the liquid state by rapid melting at 37° C., little, if any, change results. Quick shell freezing requires little additional equipment, but does require continuous storage at -5 to -20° C. Production and storage costs are only slightly more than for the liquid product, whereas the frozen product has the advantage of a longer period of usability without denaturation. The full length of this period has not been determined but in all probability it exceeds the 5 year dating period now

#### PHYSICAL CONDITION OF THE FINAL PRODUCT

The degree to which the plasma or

allowed dried plasma or serum. If low temperature ( $-5$  to  $-20^{\circ}$  C.) shipping facilities are available the frozen product may be shipped to distant points without harm.

3. *Dried plasma or serum*—Removal of the water content from plasma or serum by quick shell freezing and drying from the frozen state causes little physical or chemical change in the constituents. Studies which have extended over several years have shown that if the product is satisfactorily dried and sealed under vacuum in a good quality glass container, further changes in the composition of the dried plasma or serum do not take place. This permits a very long dating period, probably greatly beyond the 5 year dating period now allowed. In addition, since the temperature requirements for storage of the dried material are not limited as with the frozen or liquid product, it may be shipped to remote places and used under circumstances which otherwise would be impossible. It becomes the product of choice on shipboard, in remote regions of the world, and in case of widespread emergency where reserves must be kept under uncontrolled storage for indefinite periods. However, because added processing steps are involved, the unit cost is greater. Simplification of the processing equipment now generally used can be made, and freeing the processing from questionable overhead charges will undoubtedly result in reducing the unit cost to a point where dried plasma or serum may well become the product of choice for all purposes.

The chief problem involved in preparing the dried plasma or serum is the removal of the water without causing significant changes in the physical or chemical composition of the various component parts and without change in their physiological properties. Experience has shown that this involves the application of certain well under-

stood basic laws of physics and chemistry.

It is of interest to follow the historical development of the application of these laws to the desiccation of biological substances. Knowledge of the mechanical phases of desiccation may be said to begin when d'Arsonval<sup>2</sup> gave his report on the practical production of liquid air in 1898. In 1901, he made his report on the use of low temperatures as a valuable aid in research methods.<sup>3</sup> He recommended the use of methyl chloride in order to reach  $-60^{\circ}$  C., solid carbon dioxide or acetylene dissolved in acetone for temperatures of  $-112^{\circ}$  C., or even  $-115^{\circ}$  C., and finally liquid air in petroleum ether for temperatures below  $-115^{\circ}$  C. Silvered vessels with double walls enclosing a vacuum were used. Vansteenberghe<sup>4</sup> in 1903 applied vacuum over sulfuric acid without regard to the temperature for the removal of water from tissues. In 1906 d'Arsonval and Bordas<sup>5</sup> used two glass receptacles connected by a T tube equipped with a stopcock. Vacuum was obtained with an ordinary pump attached to one arm of the tube. One receptacle served as the drying chamber and was heated by immersing in water at, for example,  $15^{\circ}$  C. The other receptacle served as the condenser and was refrigerated by plunging into liquid air or simply into carbon dioxide snow mixed with acetone. They regulated the temperature of the drying chamber to meet the requirements of the substance under analysis. In 1909, Shackell<sup>6</sup> dried from the frozen state and observed that organic substances dried in this manner with the aid of vacuum and a chemical desiccant retained their physical condition better than when dried at temperatures above freezing. In 1935, Elser, Thomas, and Steffen<sup>7</sup> reported on the accumulated work of the senior author which he states began in 1909. Elser's contribution was the introduction

of the manifold which permitted the connection of many individual containers of frozen material to the condensing chamber. He also contributed the technic of storing the dried material *in vacuo*. A comprehensive analytical study of the physical phenomena involved in the process of drying from the frozen state was reported by Greaves and Adair,<sup>8</sup> in 1939.

It is also of historical interest to observe what substances have been desiccated by the technics just described. Brown and Escombe,<sup>9</sup> in 1898, exposed germinating seeds to liquid air temperatures of  $-183^{\circ}$  to  $-192^{\circ}$  C. and Thiselton-Dyer,<sup>10</sup> in 1900, exposed them to liquid hydrogen temperatures of  $-250^{\circ}$  C. to  $-252^{\circ}$  C. The seeds remained viable. Macfayden and Rowland,<sup>11</sup> in 1900, exposed 10 different bacteria, one yeast and raw milk to liquid air temperatures ( $-183^{\circ}$  to  $-192^{\circ}$  C.) for a period of 7 days without an apparent loss of viability of the microorganisms. Vansteenbergh,<sup>4</sup> in 1903, desiccated rabies virus infected rabbit brain at room temperature and found it viable and fully virulent 9 months later. In 1906 d'Arsonval and Bordas<sup>5</sup> dried a variety of non-viable organic substances without causing any change in the substances. Shackell,<sup>6</sup> in 1909, successfully dried from the frozen state a wide variety of foods and other organic substances, including immune hog cholera serum, the serum of guinea pigs, and fresh uncoagulated dog's blood. Except for the loss of moisture, he was unable to note any change in the substances. Harris and Shackell,<sup>12</sup> in 1911, dried whole rabbit brains and cords from rabies virus infected animals by the Shackell method and the virus was shown to remain infective for at least 4 months. Hammer,<sup>13</sup> in 1911, successfully dried bacteria by the Shackell method of desiccation from the frozen state.

From this historical review of the lit-

erature it will be seen that the physical laws essential to desiccation from the frozen state, as we understand it today, were made known and their applicability demonstrated prior to 1912. More recent reports have merely served to confirm the earlier work and to offer refinements in the mechanics of applying these laws to the problem of desiccation.

This discussion would not be complete without mention of the work of Cohn<sup>14</sup> with the serum albumin fraction from human blood. Physical and chemical studies of this fraction, physiological studies of its behavior in laboratory animals, and a limited number of therapeutic trials in humans indicates its usefulness where the problem is one of restoration of blood volume. Serum albumin can be readily precipitated out of plasma or blood with ethanol-water mixtures to whatever degree of purity is desired. It possesses a very high osmotic pressure, has a low viscosity index, and is readily soluble in water. The aqueous solution readily passes through antibacterial filters, and the finished product remains clear and unchanged even under adverse conditions of storage. Assuming that adequate clinical trials confirm the present opinion of its therapeutic usefulness, serum albumin may well replace whole plasma or serum in those instances where the problem is one of restoration and maintenance of blood volume.

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## Three Posters

IN the advertising profession the word "standout" is used to describe the exceptional or the meritorious. If the advertising gentry were to judge three venereal disease posters just released by the U. S. Public Health Service, there is no question that these would be termed "standout posters." The posters to which we refer deal with prostitution, blood tests for syphilis, and home remedies for gonorrhea. These are difficult subjects to depict in poster technic and only through skillful interpretation can they be presented for public display.

The Public Health Service has used precisely the right approach to these subjects, and the result is a series of posters that are distinguished on many counts. The most striking feature of each is the elaborate, though highly effective, use of color, and the terse text which can be read at a glance. These posters should be widely used, as their forceful messages need to reach many segments of our population at present.

—From copy prepared for "Credit Lines"—  
more on pages 317-322.

# Statistical Work in the Health Department\*

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A GREAT many papers have been written and read about the statistical needs of a health department. Much less attention has been given to the problems of actually achieving these objectives and the relative success or failure of the present methods of vital statistics organization in doing so.

Briefly stated, an effective public health organization needs two types of statistical information and service. One includes all that is usually given the name of "vital statistics," whereas the other pertains to the analysis of other types of public health and medical data. With vital statistics are included data about the death rate and the birth rate, the age, sex, and racial distribution of deaths, the causes of death, the proportion of births and deaths which have received hospital care, and all the other vast amount of information which can be obtained from the tabulation and study of birth and death certificates. But the health department needs also the other important type of statistical work. Medicine has passed from the realm of art to that of quantitative science, and to an ever greater degree every aspect of the public health program is being tied to a numerical appraisal of its value and efficiency. In addition to the study of vital statistics, the public health administrator is constantly asking for a statistical and

quantitative answer to endless questions, such as: Do the laboratory technics used in the various state laboratories give comparable results? What does the recent survey show about the dental condition of our school children? What data are there to evaluate the success of maternal and child hygiene work? How extensive is venereal disease and how can the progress of the prevention and cure program be evaluated?

These two types of statistical work in the health department are not intrinsically different; they are merely based on data collected in different ways. And a great deal of value of the records of a health department is obtained by studies of the interrelations among data collected from such different sources. For example, upon careful analysis the records of the Division of Vital Statistics yield valuable information. Similarly analyzed, the records of the Infant and Maternal Hygiene Service are of value. However, additional information of perhaps equal or greater value can be obtained by relating these two sets of independently collected data.

If the statistical needs of a health department are visualized in this broad way, it is apparent that from their historical beginnings the state departments of public health in the United States have had an unparalleled opportunity to achieve a high standard of statistical accomplishment. From the early days of American public health work, most state public health offices have had complete control over the collection, tabulation, and analysis of those most impor-

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\* Read before the American Association of Registration Executives and the Vital Statistics Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 14, 1941.

tant statistical documents — the birth and death certificates. The state health department has had the golden opportunity to develop around these basic vital statistics data a well founded and comprehensive organization for the quantitative study of public health problems and progress.

The unique possibilities of the American system of organization become clearer when it is compared with that of other nations of the Western Hemisphere. In most South American nations, a system for the registration of births and deaths has been long established. However, the principal, almost sole, purpose of this registration system has been to record and preserve the facts of birth and death for their legal value. For this reason, the civil register and the public health office are two completely separate and distinct organizations. As a result, the rapidly growing public health organizations of the other American republics find themselves without the basic mortality and natality data which they need for their work. Having no sources of their own, they are dependent upon what they can get from a civil registration organization which is not appreciative of public health needs nor equipped to supply the service and data for which the public health office has a legitimate use.

In the United States, not all states have taken full advantage of the possibilities of the typical American plan under which the registration of births and deaths is a part of the public health organization. Some states perform a high quality of work in respect to both the objectives of legal registration and in the utilization and analysis of vital statistics for public health purposes. However, it is not an exaggeration to state that, whatever are the *potential* advantages of our present system of vital statistics, in many areas of the country this present system is facing imminent breakdown and failure.

Vital statistics has been an integral part of public health for two main reasons. In the first place, it was believed that the health organization would be a proper and efficient organization to develop and administer registration for its legal purposes. Secondly, it was recognized that a good public health program required the data which could be obtained from a study of the registered documents. It is now apparent that these two objectives are not being generally attained. Recent fast moving developments in the field of vital statistics show that the vital statisticians of this country face serious problems of organization.

It is no secret that registration in this country is not complete. This is particularly true for birth registration. The reason is obvious. For years the problems of registration have been the "step-child" of the health department. Many health officers, considering registration as extraneous to public health administration, have given little attention or support to efforts to complete and perfect registration. In many instances state officials have been reluctant to enforce registration laws, and no champion has appeared to fight the battle for adequate appropriations for this purpose. As a result, literally millions and millions of American-born citizens now find themselves without any documentary proof of the facts of their birth. And this is now acutely apparent at a time when such proof is of greatest importance for national defense employment, and a hundred and one other purposes.

This underregistration is now having another result which, from the interests of public health, is equally serious. The need for birth certificates has swamped the state offices with requests for certified copies. Many of the 60,000,000 Americans whose births were not originally registered, are flooding the state vital statistics offices with applications

for delayed filing. Each week, the Bureau of the Census is receiving increasing thousands of requests for age certification from Census records. This experience is paralleled in almost every state office. Many state vital statistics offices are now facing a work-load that they are not prepared to meet. To help solve the problem, special clerks are being hired and assigned to the work. During the past several years an incredible amount of WPA funds has been poured into state and city offices in an attempt to complete and bring up-to-date indexes and files of certificates. Only recently the Bureau of the Census has obtained over a million dollars to be spent within 6 months for state help on delayed registration. But the serious point is that all this represents a diversion of money and time from the analytical work of vital statistics. In almost every state this analytical work is being delayed and neglected. Some states have stopped completely the tabulation of vital statistics.

The opportunity to achieve a comprehensive, well integrated public health statistical office is vanishing. The objective of complete registration has not been attained, and many public health administrators now find their vital statistics office to be nothing more than an enormous filing cabinet, rather than a valuable organization to assist in the quantitative study of public health.

A partial solution to these difficulties may possibly be found in a reshuffling or reorganization of the statistical work within the health department. No uniform pattern for a statistical organization is followed by all states. Some states have made special provisions to meet the dual needs of registration and analysis, but many follow the usual pattern of a central vital statistics office with modifications depending upon the present need for analysis, the available personnel, and other resources. The existing kinds of organizations may be

grouped into four general types. It is worth while to examine each of these types of statistical organizations and to consider its possible efficiency in reference to the analytical and registration work with which we are concerned.

One type of statistical organization might be called the decentralized system. Under this plan there is no one central statistical office for the whole health department; each different division provides its own statistician. Each division develops its own forms, tables, and methods of analysis. Perhaps it even has its own installation of tabulation equipment. It is obvious that this plan is possible only in a large health department where the different divisions have sufficient statistical work to justify a separate statistical service for each.

Several state public health offices have this plan of independent statistical units, and in New York State, for example, the decentralized plan is quite feasible. In New York State, the Division of Vital Statistics works in collaboration with the statisticians of other divisions, and there is a ready exchange of basic data. But the statisticians employed by the various subject-matter divisions are not administratively responsible to any one chief. A certain amount of integration of work and methods is accomplished by seminars and interdivisional conferences, but the system is definitely decentralized. Although the Division of Vital Statistics carries on extensive analytical research, this research is confined largely to the analysis of vital statistics data.

The statistical service that had been established in Tennessee is exactly opposite in type. In this state, the statistical service is not decentralized but is very definitely concentrated in one central office, which is almost an integral part of the office of the Director of Public Health. The statistical office is a service unit for all of the regular operating divisions of the department.



An important aspect of this plan is that the analytical work on vital statistics, which in most states is done in the registrar's office, has also been taken over by the central statistical service. The Division of Vital Statistics is concerned primarily with problems of registration, filing, corrections, certified copies, and some routine coding. The statistical work is definitely separated from registration work.

Another plan for a centralized statistical service is to be found in the State of Alabama. In this state the analysis of mortality and natality data is not taken out of the Division of Vital Statistics. On the contrary, the analysis of other public health statistics is carried on as a regular function of that division. The regular work of the state registrar is not, therefore, limited to registration problems; it includes the rather extensive statistical analysis of vital statistics data as published in the annual Alabama reports, and also a variety of tabulations and studies for other health department divisions. This service work to other divisions means that the Division of Vital Statistics supplies these divisions with special tabulations of vital statistical data, consults with them on coding, tabulating, and analytical problems, and makes special tabulations of their own data for them. The Division of Vital Statistics also controls the central installation of tabulating equipment and acts as a service unit to administrative statistics.

A new type of organization is now being developed in Louisiana. As a part of a general plan for the reorganization of the state government and the Department of Public Health, there has been created a new Division of Public Health Statistics. Concentrated into one administrative unit are all the functions of collecting, tabulating, and analyzing for the whole health department. That the functions and duties of this division are more extensive than those relating

to births and deaths is indicated by the fact that the name of this division is the Division of Public Health Statistics, not the Division of Vital Statistics.

This new division is divided into three main sections—one for registration, one for tabulation, and one for analysis. But the section for registration embraces more than the registration of births and deaths. Included also are morbidity registration and the collection of other kinds of data needed for the health program. Similarly, the sections for tabulation and analysis extend their functions to all other public health statistical problems. In this type of organization, vital statistics in its traditional sense has been superseded by a larger and more comprehensive statistical organization.

To the extent that these organizational plans make provision for public health statistical work and also separate and independent provisions for registration work, they may help solve the basic conflict which now exists between these two competing vital statistics activities. But as long as the total funds are limited, there still remains the basic problem of finding some way to keep the ever-increasing load of registration from overshadowing and smothering the equally important analytical work.

It is not the purpose of this paper to suggest a solution to this dilemma. It is intended here only to present the problem and attempt to stimulate discussion among registrars and public health officials regarding possible methods both to improve registration and to advance the work of the statistical analysis of public health problems.

Perhaps in some states, a reorganization giving more emphasis to vital statistics and an increase in available funds will suffice. However, perhaps the time has now come for a more fundamental change in the vital statistics system. One solution would be for the public health system to give up the responsi-

bility for registration. Following the South American pattern, a state civil registration system could be set up which would be entirely independent of the state health offices. The public health statistical office would then be free to concentrate on the interpretation, publication, and distribution of factual data. Some New England states have always operated in this way. The real importance of the birth and death certificates in the administration of a public health program is the most forceful argument against this complete separation of registration and public health statistics.

Another possibility is for the state public health offices to concentrate on the problems of registration and to discontinue the tabulation and analysis of vital statistics. The statistical data of some other organization, such as the Bureau of the Census, could then be used by the state health offices. This

suggestion is perhaps the most unsatisfactory of all because no one would claim that the Bureau of the Census publications can ever be completely adequate for the current administration needs of a health office, nor can they be designed in sufficient detail or in a way to fit the needs of each different state.

The optimum solution is probably neither of these, but some other which combines the advantages of all. Some method must be found that can keep the basic vital statistics data close to, and available for the use of, local and state public health offices. At the same time, some relief must be given the state vital statistics offices in the heavy and responsible work of registration. These offices must be permitted to become truly statistical offices, with the time and facilities to play their full part in the quantitative study, planning and evaluation of the problems and success of the state public health program.

# Chorio-Allantoic Membrane Infection as a Diagnostic Test for Smallpox\*

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SEVERAL laboratory tests for smallpox have been devised; these may be classified as "infective" or serological. Schultz, Bullock, and Lawrence<sup>1</sup> and others obtained unsatisfactory results with complement-fixation in the diagnosis of smallpox but Craigie and Wishart<sup>2</sup> and others have been more successful. Craigie and Wishart<sup>2</sup> found that complement-fixation was somewhat more sensitive than the flocculation reaction. Of the "infective" tests, the Paul test, which is performed on the rabbit's eye, was employed by Scott and Simon<sup>3</sup> with success. Both Toomey and Gammel<sup>4</sup> and Defries and McKinnon<sup>5</sup> were somewhat less successful, while Jorge<sup>6</sup> and others obtained unsatisfactory results. Defries and McKinnon<sup>5</sup> advocated the difference in dermal response of susceptible and vaccinated rabbits as the basis for a laboratory diagnostic test. With rare exceptions, none of these tests has been reported to give "positive" findings in chicken pox. Each of these tests has failed to win wide acceptance in the United States.

Following the fundamental observations of Woodruff and Goodpasture<sup>7</sup> with the fowlpox virus, several of the pox viruses were propagated in the chorio-allantois of the developing fertile hen egg. Both Buddingh<sup>8</sup> and

Irons and his associates<sup>9</sup> suggested that chorio-allantoic infection might have value as a diagnostic test for smallpox. Irons, Bohls, and Hartman<sup>10</sup> found the chorio-allantois was more susceptible than the rabbit's cornea to variolation. Since health officers sometimes desire laboratory aid in dealing with mild, sporadic cases of possible smallpox or with fulminating chicken pox, we have given more attention to the chorio-allantoic infection test.

## THE MANIPULATION OF EGGS

A satisfactory source of fertile eggs is a prerequisite. Eggs may be incubated successfully in the bacteriological incubator if a large pan of water is added to increase the relative humidity and other details are given attention. Eggs are likely not to do well in hot summer weather. We have employed essentially the window technic of Goodpasture and Buddingh,<sup>11</sup> which permits ready inspection of the chorio-allantois at any time. Since cutting the egg shells with file or carborundum pencil was rather tedious, we employed a modified dental drill, consisting of a reversible motor with foot pedal control and a flexible shaft, driving a slip clutch handpiece. A candling device enables one to check viability and location of the embryo and attached membranes. Windows were constructed by removing a section of shell flap approximately 1 cm. square over the larger blood vessels

\* Read before the Laboratory Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 17, 1941.

and by the substitution of a coverslip over a wax base. This operation requires some skill and attention to good technic in order to avoid excessive bleeding by puncturing the membranes. Eggs with windows should be handled with care to avoid adhesion of the cover glass to the membrane. For excision or final detailed examination of the chorio-allantoic membranes, the top of the egg is made bare by cutting around the window.

#### COLLECTION OF SPECIMENS

Consideration was given dermal lesions rather than blood specimens and throat or nasal swabs. Since sensitivity of the test depends very much on the collection of ample and satisfactory specimens, it is fortunate that the physician is likely to visit the patient when the lesions are rich in virus content. We recommend the avoidance of facial lesions and those elsewhere which have been broken by scratching or rubbing, since these are prone to be mixed with staphylococcal infections or contaminations. Several virgin pustules should be carefully cleaned and rubbed dry with alcohol and their contents should be aspirated individually or in small pools and transferred to sterile moist tubes; the tubes may contain a small amount of sterile, neutral glycerin. The specimens should be properly sealed and rushed to the laboratory, preferably on dry ice or in a cold box. Crusts are likely to be less satisfactory, but should be requested in the absence of semi-fluid contents.

#### INOCULATION OF EGGS

Several suitable eggs should be employed in each test. Rapid tests for bacteria enable one to use the specimens to best advantage; occasionally it is advisable to request the collection of additional and more suitable specimens. Selected specimens

should be triturated or resuspended in a small amount of sterile saline diluent, and a few drops of inocula should be dropped through the windows of eggs on uninjured membranes. One should avoid opening windows longer than is necessary. The use of saline diluent tends to retard excessive dehydration and promotes spreading the inoculum over the membranal surface. The eggs should be incubated at a temperature of 35°–36° C. and should be inspected carefully once or more daily.

#### DESCRIPTION OF LESIONS OF EXPERIMENTAL SMALLPOX IN PRESUMPTIVE POSITIVE TEST

These descriptive data on experimental smallpox apply to bacteria-free lesions in eggs incubated 10–14 days at time of inoculation. Contaminated or mixed lesions were subject to great variations and frequently resulted in early embryonic death. In the presumptive positive test, the minute lesions were rarely detected in less than 24 hours. The character of the lesions depended somewhat upon the severity of the infection on the membrane. Considerable variations occurred in the number of pocks which appeared, even in the several membranes inoculated with the same material. If 10 to 100 pocks appeared, these usually reached a maximum diameter of about 1 mm. in 72 hours. When a heavier infection with crowding occurred, the average diameter of the pocks was somewhat less; peripheral pocks oftentimes were larger. In about 30 hours the pocks were invariably clearly visible, although scarcely more than pinpoint in size, as watery, raised, rounded, discrete spots. These lesions resembled those in actual smallpox and seemed to evolve through the classical stages of the smallpox lesion, but the whole process was much speeded up and in miniature. As

a rule, individuality of the pocks was well retained until the 4th or 5th day when coalescence occurred, giving rise in the heaviest infections to creamy areas of pustulation, or, in lighter infections, to more rapid formation of areas of desiccating, necrotic tissue. These necrotic plaques were cast off when the chick hatched. The evolution of the lesions, with each of the 18 isolates which we obtained from patients with smallpox, has followed along essentially the same pattern, which was characteristically rather different from what we have observed with influenza, vaccinia, herpes and certain other viruses, bacteria, and fungi. Contents of pustules have given better results than crusts; failures have been much more frequent with the latter.

generally can be attached to the presumptive positive test. To confirm and complete the presumptive positive test, the following criteria have been utilized: (1) increase in number of pocks by sub-inoculation, (2) demonstration of histological picture consistent with smallpox, (3) demonstration of elementary bodies, and (4) significant diminution in pock count under the influence of antivaccinal serum. Not all of these criteria are required for every test.

#### ATTEMPTED SMALLPOX PASSAGE IN EGGS

At the first indication of smallpox lesions in eggs, and concurrently with sterility and other tests to exclude possible bacterial and related infections, one should attempt to transfer the infection to other egg membranes.

TABLE 1

*Summarized Laboratory Findings in Eighteen Cases of Smallpox Established in Chorio-allantois of Embryonated Hen Eggs*

#### *Results with Original Specimens and with First Chorio-allantoic Transfer*

<i>No. Eggs in Test</i>	<i>No. Eggs " Positive " *</i>	<i>No. of Pocks in Membranes †</i>	<i>No. Eggs in Test</i>	<i>No. Eggs " Positive " *</i>	<i>No. of Pocks in Membranes †</i>
10	9	3, 3, 3, 3, 4, 4, 4, 4, 5	4	4	4, 5, 5, 5
18	4	1, 2, 3, 3	4	4	3, 4, 5, 5
8	6	2, 3, 3, 3, 3, 4	4	4	4, 5, 5, 5
12	6	2, 3, 3, 3, 4, 4	4	4	3, 5, 5, 5
18	14	2, 5, others 3 or 4	6	5	4, 5, 5, 5, 5
10	8	1, 2, 2, 2, 3, 3, 3, 4	4	4	4, 5, 5, 5
8	6	1, 2, 2, 3, 3, 4	4	4	4, 5, 5, 5
8	6	4, 4, 4, 5, 5, 5	4	4	4, 5, 5, 5
6	6	4, 5, 5, 5, 5, 5	4	4	5, 5, 5, 5
8	6	1, 2, 3, 3, 4, 5	6	5	3, 4, 5, 5, 5
12	5	3, 3, 4, 4, 4	4	4	4, 5, 5, 5
8	7	3, 3, 4, 4, 4, 5, 5	4	4	3, 5, 5, 5
12	4	1, 2, 3, 3	6	6	3, 4, 5, 5, 5, 5
8	6	4, 5, 5, 5, 5, 5	4	4	4, 5, 5, 5
6	6	3, 4, 4, 4, 5, 5	4	3	5, 5, 5
8	5	2, 2, 3, 3, 4	4	4	2, 4, 5, 5
6	6	3, 4, 4, 5, 5, 5	4	4	4, 5, 5, 5
8	4	2, 3, 4, 4	4	4	4, 5, 5, 5

\* Bacteria-free with characteristic lesions

† 1=1-2; 2=3-10; 3=11-50; 4=51-200; 5=above 200

#### THE COMPLETED POSITIVE TEST

We have generally avoided reporting definite evidence of smallpox until the test was completed; although, as we have gained in experience we have come to believe that much importance

Nearly always in experimental smallpox we have found an increased number of pocks at the first transfer, as shown in Table 1. Each of 18 isolates was carried through several egg passages. Hen egg propagated smallpox was also

successfully transferred on chorio-allantoic membranes of pheasant, duck, turkey, and goose eggs.

#### HISTOLOGICAL FINDINGS IN EXPERIMENTAL SMALLPOX

Histologically, the well defined foci, corresponding with the visible lesions, and consisting of cellular proliferation, inflammation and necrosis, were invariably outstanding. While all three embryonic layers were often involved, the entoderm was attacked to a lesser extent. The ectodermal cells were particularly involved and these suffered the most pronounced necrotic effects. The mesoderm was edematous in the involved areas and, as the changes progressed, contained an increased number of inflammatory cells which scarcely tended to wander into the entodermal areas. Where necrotic changes were not too pronounced, and particularly in the more involved lesions, intracytoplasmic inclusion bodies were frequently seen in the ectodermal cells. These acidophilic structures varied somewhat in size and shape and were characteristic of the classical Guarnieri bodies. Guarnieri bodies were not found in every focal lesion and particularly with respect to the milder infections.

#### DEMONSTRATION OF ELEMENTARY BODIES

In carefully prepared films from smallpox lesions, which were stained by the Morosow<sup>12</sup> method, it was usually possible to demonstrate moderate numbers of elementary bodies. The technic was controlled by the use of both uninfected and vaccine infected membranes. In lightly infected membranes one should be sure that an actual pock is spread on the slide. In employing the Morosow or similar technic, careful attention must be given the details to avoid the appearance of ruinous precipitates. Large numbers of evenly distributed elementary bod-

ies, which are commonly found in vaccine films, were seldom encountered in smallpox films.

#### EFFECT OF HYPERIMMUNE, ANTIVACCINIAL RABBIT SERUM ON POCK COUNTS

Hyperimmune, antivaccinial rabbit serum should exert a protective effect against not only vaccinia but also to a lesser extent against smallpox. We have employed two moderately potent antivaccinial sera with controls in repeated tests with smallpox virus on egg membranes. It was usually possible to obtain a definite reduction in pock count which could be attributed to the influence of antiserum, although the results were subject to considerable variation. Pocks which appeared in the presence of antivaccinial serum tended to be only slightly smaller or delayed in appearance in comparison with controls. Normal rabbit serum and saline diluent respectively mixed in equal amounts with decimal, supernatant virus suspension constituted the controls. Mixtures were left in the cold room at a temperature of 4°-8° C. overnight and a total of 0.4 ml. was pipetted after gentle agitation to each of a dozen eggs in each test.

#### NEGATIVE FINDINGS

In the presumptive negative test at least 4 embryos should be viable after 48 hours, none of which bear possible chorio-allantoic smallpox or other lesions. In this connection one must be thoroughly familiar with nonspecific changes. Sterile ulcers are most likely to occur in membranes of the younger embryos, and particularly at sites of trauma. Mild surface irregularities may occur as a result of excessive dehydration or for other reasons. The negative finding is completed if the sub-inoculation of pooled, triturated, sterile membranes results in failure to detect smallpox lesions in a satisfactory

group of egg membranes. The completed negative report should be available ordinarily in 96 hours.

#### ATTEMPTED REPRODUCTION OF CHICKEN POX LESIONS

On numerous occasions we are able to obtain satisfactory specimens from cases of chicken pox. Excepting a couple of clinically doubtful cases, neither of which had been vaccinated and from which the smallpox virus was obtained, the inoculation of chicken pox specimens invariably has failed to elicit the appearance of detectable lesions of the chorio-allantois. Attempted membrane passages, on the assumption that initial reactions might be inapparent, have also given completely negative results and we failed to obtain specific histological changes consistent with those in chicken pox. It seems evident enough that the hypothetical chicken pox virus is unable to affect the chorio-allantois in a visible manner.

#### PROPAGATION OF HERPES VIRUS IN CHORIO-ALLANTOIS

Dawson<sup>13</sup> and others have described the development of herpetic lesions in the chorio-allantois of embryonated eggs. On several occasions we have infected the chorio-allantois with blister fluid from herpetic lesions, and under standard culture conditions these infections have behaved much alike. By careful daily observation it was evident that herpetic lesions tended to develop somewhat differently from those of smallpox, although it must be admitted that the lesions were occasionally somewhat similar. However, herpetic blisters tended to be smaller, more superficial and irregular, and proportionately somewhat less edematous and short-lived than smallpox lesions. Intracellular inclusion bodies consistent with those in herpes were also demonstrated. The appearance of herpetic

blisters was not significantly influenced by antivaccinal sera.

#### ATTEMPTED REPRODUCTION OF LESIONS IN MISCELLANEOUS CONDITIONS

We failed to obtain specific chorio-allantoic lesions with blood and dermal lesions from 3 cases of measles. Rake and his associates<sup>14</sup> apparently have propagated the measles virus in embryonated eggs, but the variable, sporadic lesions which these workers have described could hardly be confused with those of smallpox. We also failed to effect chorio-allantoic alterations by means of material from a case of herpes zoster. Dermal preparations in a few instances of drug rashes and likewise from syphilitic conditions failed to elicit specific chorio-allantoic lesions. Staphylococcal infections were encountered frequently in this series but streptococcal or mycotic infections were seen much less often.

#### DISCUSSION

From 18 of 27 cases of smallpox, characteristic smallpox lesions were reproduced in the chorio-allantois of embryonated hen eggs. Failures were more often encountered in advanced cases where desiccation was most marked. The lesions obtainable in experimental smallpox of the chorio-allantois were applicable in a rapid presumptive diagnosis of smallpox. Standard procedures have been described and the necessity of following standard methods has been stressed in the early recognition of chorio-allantoic lesions. This test involves the reproduction of specific lesions in the absence of bacterial or other agents; in this respect, the goal is pure culture of the smallpox virus. The technic of chorio-allantoic culture is not difficult to master but its application to the diagnosis of smallpox may give disappointing results in the hands of the uninitiated.

Although our experience indicates

that the presumptive positive test ordinarily may be readily confirmed, the completed test should not be neglected and certainly should be performed whenever a doubtful situation arises. Unless quite satisfactory specimens are employed by an experienced worker, a negative outcome should be given only minor consideration in the exclusion of smallpox and should never be allowed as an excuse for neglecting vaccination.

In submitting specimens for a laboratory test, the physician should not relax his efforts at careful clinical observation. The evidence should be considered in the light both from the laboratory test and from careful investigation. In the performance of this test, as in much laboratory work, a disadvantage is attached to dependence upon submission of satisfactory specimens. In our experience, the physician is very anxious for helpful suggestions and appreciates a suitable collection outfit to aid in obtaining satisfactory specimens. It is possible that the sensitivity of this test may be extended by the laboratory application of methods tending to destroy bacteria in the frequently contaminated crusts, or by other refinements of technic.

Our findings corroborate those of Burnet and Lush,<sup>15</sup> Buddingh,<sup>8</sup> and others concerning the apparent insusceptibility of the chorio-allantois to the chicken pox virus and those of Bohls and Irons<sup>16</sup> regarding the practical utilization of chorio-allantoic infection in the embryonated hen egg as a diagnostic aid in suspected smallpox.

#### SUMMARY AND CONCLUSIONS

Eighteen isolates of smallpox virus were propagated in the chorio-allantois of embryonated hen eggs in an environment free from bacteria and fungi. Characteristic lesions, which were consistent with those of smallpox, appeared

in less than 48 hours and were applicable in the laboratory diagnosis of smallpox.

The presumptive positive result was available usually on the 3rd day. Four days were required for the completed negative test. Final identification of the lesions required the application of additional cultural, microscopic, histological, or serological methods.

Tests with chicken pox specimens gave negative results. The chorio-allantoic infection test should be carefully applied in the light of clinical findings and a negative outcome should not result in withholding vaccination against smallpox.

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## Rheumatic Fever Reportable in California

ACCORDING to *Western Public Health* the California State Department of Health has made rheumatic fever reportable by physicians.

### *"Conjunctivitis Spread Checked in Shipyards"*

"An epidemic of acute kerato conjunctivitis which has affected over 500 employees in shipbuilding establishments in the San Francisco Bay area is being investigated by the Bureau of Epidemiology, Laboratories, and Influenza Research of the California State Department of Health and the Industrial Hygiene Service.

"A department bulletin states that the condition is evidently infectious in origin but that laboratory examinations of smears and cultures obtained from

the eyes of workers have so far failed to identify the causative organism. Animal inoculations have been made to determine whether a virus is responsible for the conjunctivitis.

"Control measures which have been adopted by plant officials upon the recommendation of the State Health Department, including segregation of affected employees, establishment of separate examination and treatment rooms, crews, and equipment for eye cases; thorough sterilization of welding goggles, helmets, and other personal protective equipment; and careful personal hygiene to prevent transmission of the infection from one worker to another, have resulted in a rapid decrease in the number of new cases."

# Studies on Syphilis in the Eastern Health District of Baltimore City\*

## III. Study of the Prevalence of Syphilis Based on Specific Age Groups of an Enumerated Population‡

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ACCURATE measurement of the trend of syphilis is difficult because of certain inherent characteristics of the disease itself and because of factors of selection which frequently operate in studies of incidence and prevalence. For the past five years studies have been conducted in the Eastern Health District of Baltimore City in an effort to evaluate existing methods for the measurement of this trend.<sup>1, 2</sup> A resumé of the problems frequently encountered in prevalence and incidence studies has recently been made by one of us (T.B.T.).<sup>3</sup>

In a disease such as syphilis the operation of an attack rate over a period of years results in an accumulation of persons with syphilitic infection and syphilitic disease of varying degree. Data on this accumulation of past and present syphilitics, defined as prevalence in these studies, are not easy to assemble, for it is necessary to know not only the number of persons in any group that shows evidence of syphilis

(i.e., a positive serologic test or characteristic lesions) at the time of the study but also those who have ever shown such evidence in the past.

A study of the extent of this accumulation in the Eastern Health District was initiated in 1939 because of the availability of certain data on the general population of the district. During that year this population was enumerated according to age, sex, color, and certain social-economic factors by the Department of Biostatistics in coöperation with the Baltimore City Health Department.<sup>4</sup> From these records the names of all Negro residents of the ages 20–24 years and 35–39 years were chosen for study.

The age group 35–39 was selected, first, because other studies in the District<sup>1</sup> and elsewhere<sup>5</sup> indicate that the attack rate of syphilis among colored persons of this age group is very low and consequently few persons not already infected will become so after age 35; second, while in a certain proportion of persons with syphilis spontaneous reversal of serologic tests is believed to occur, a minimum of such reversals has probably taken place at these ages. Prevalence rates, therefore, should be at or near their peak.

The ages 20–24 were selected because

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† From the Syphilis Study of the School of Hygiene and Public Health, The Johns Hopkins University.

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the prevalence rates among these persons should reflect the operation of an attack rate in the recent past and thus give an indication of the problem of early syphilis in the area under consideration.

It should be emphasized that these groups are entirely unselected as regards syphilis. While prevalence rates for syphilis based on these groups are not truly representative of the District population as a whole, they may be used as one index of the situation regarding the disease in this community. Moreover, the rates for the same age groups from year to year should accurately reflect the trend of the disease in the District.

#### METHOD

The area of study consisted of two wards in Eastern Baltimore with a total population of 57,042, 24 per cent of which is Negro. The study group comprised 2,395 Negroes, 17.8 per cent of the entire colored population. There were 467 males and 651 females of ages 20-24, and 646 males and 631 females of ages 35-39.

The name, age, address, hospitals attended, and other pertinent data on every person in these four groups were obtained from the census records of the Department of Biostatistics, and a card was made for each individual. Each card was then checked against our own department syphilis status master file of some 35,000 names of Eastern Health District residents<sup>1</sup> and against the records of various hospitals, clinics, and laboratories in the city in order to disclose any recorded evidence as to the syphilis status of the individual as of 1939. After existing records had been thoroughly searched, a visit was made in an attempt to locate each person on whom no data had been found in order to persuade each one to submit to an examination for syphilis. In order to establish absolute minimum rates, very

rigid criteria were used in classification. A person was considered "syphilitic" on the basis of definite diagnostic data; a positive serologic test, a definite history of specific treatment for syphilis, or written records of previously positive serologic tests. For a "non-syphilitic" classification, a negative serologic status did not suffice unless it was accompanied by entirely negative history and physical examination. A person whose status was unknown as of 1939 but who was known to be negative prior to 1939 or found positive since 1939 was classified as "no data" along with those on whom there was actually no information available.

The first classification as regards syphilis status was made therefore on the basis of these very rigid criteria, and the prevalence rates, when computed on the total number of persons in the group, are absolute minimum figures. It is possible, however, to establish a closer approximation to the actual prevalence rates by making certain corrections. These corrections were made for subsequent classifications and are discussed below.

#### RESULTS

At the close of the period allotted for the study some information relative to syphilis had been obtained on approximately 80 per cent of the entire group. On the basis of these data all persons in the study could be placed in one of the three categories: (1) those found to have or have had syphilis, (2) those who were non-syphilitic, and (3) those on whom no data were obtained. Syphilis prevalence rates were calculated not on the basis of examined persons only but on the basis of all members of the original groups.

*Prevalence rates according to age and sex*—In Table 1 are shown the prevalence rates for all persons in the two age groups studied. These rates are computed in terms of the *known* syphilis

TABLE 1

*Syphilis Status of Negroes Aged 20-24 Years and 35-39 Years in the Eastern Health District 1939*

*(Definitely Known Syphilis Status Only)*

	Age 20-24						Age 35-39					
	Male		Female		Total		Male		Female		Total	
	Num- ber	Per cent	Num- ber	Per cent	Num- ber	Per cent	Num- ber	Per cent	Num- ber	Per cent	Num- ber	Per cent
Syphilitic	92	19.7	204	31.3	296	26.5	217	33.6	255	40.4	472	37.0
Non-syphilitic	272	58.4	346	53.2	618	55.3	252	38.9	248	39.3	500	39.2
No data	103	22.9	101	15.5	204	18.2	177	27.5	128	20.3	305	23.9
Total	467	100.0	651	100.0	1,118	100.0	646	100.0	631	100.0	1,277	100.1

status in 1939, and represent the absolute minimum of syphilis infection in each group. In the 20-24 year groups the female rate is 50 per cent higher than that for the males, 31.3 per cent as compared with 19.7 per cent. This order of magnitude was expected because as a rule females are infected earlier than males. The degree of magnitude, however, is startling because it indicates that almost one-third of all Negro females and one-fifth of all Negro males in this area are infected with syphilis before they reach 25 years of age. In the older groups a minimum of 33.6 per cent of the males and 40.4 per cent of the females were syphilitic. The older female rate is approximately 20 per cent higher than that for the males, but this difference is within chance variation. It is possible that the ultimate prevalence of syphilis is approximately the same in the two sexes, the male infection being acquired at

later ages than that of the females. The rate for males increases by 70 per cent between the ages of 25 and 40 and that for females only 29 per cent. It should be pointed out here that any actual or estimated number of syphilitics in the "no data" group will increase the syphilis rates. This is taken into account in a later table.

*Prevalence rates according to various social and economic factors*

*Marital status*—Table 2 shows the prevalence rates according to marital status. Among single persons of the ages 20-24 the rates for females, 36.4 per cent is twice that for males, 18.6 per cent. The proportion of unknowns was almost identical in the two groups. In each age group the rates for married males were approximately the same as those for single males. The rates for those previously married were higher than either but the differences were not statistically significant. The rates for

TABLE 2

*Syphilis Prevalence Rates According to Marital Status of Negroes Aged 20-24 Years and 35-39 Years, Eastern Health District 1939*

	Age 20-24				Age 35-39			
	Male		Female		Male		Female	
	Number	Per cent Syphilitic	Number	Per cent Syphilitic	Number	Per cent Syphilitic	Number	Per cent Syphilitic
Single	269	18.6	242	36.4	109	31.2	46	54.4
Married	162	19.1	327	24.5	440	31.8	401	36.2
Previously married	36	30.5	82	43.9	97	44.3	184	46.2
Total	467	19.7	651	31.3	646	33.6	631	40.4

single Negro females in both age groups were significantly higher than those for married ones, but did not differ appreciably from the rates observed among those who had previously been married.

*Education*—Approximately 9 per cent of the older group had attended high school, whereas 24 per cent of the younger group received at least this much schooling. The prevalence rates among those who reached high school or beyond were generally lower than those among persons with less education. However, only in the younger group were the differences statistically significant. These results may be a reflection of the educational campaign directed to the venereal diseases during the past few years.

*Employment status*—In all groups the rates among the unemployed were higher than among those regularly employed but the differences were within sampling variation.

*Social economic classification*\*—The group classifications used for the purpose of this study were: (1) skilled and semi-skilled, (2) laborers and no usual occupation, and (3) the servant class. The rates observed according to this classification reflected the rates of the specific age and sex groups themselves and no statistically significant differences could be demonstrated with respect to social-economic classes within the specific groups.

#### ESTIMATION OF CORRECTED TOTAL SYPHILIS RATE

In all the prevalence rates given above the "no data" group has been considered as entirely non-syphilitic, and the rates have been based on the number of known syphilitics in the total population of the respective age groups.

Obviously this is not the true situation, since almost certainly there were some cases of syphilis among the "no data" group. While no information regarding syphilis is available on the individuals comprising the "no data" group, data are available which will permit an estimate of the proportion of syphilitics and non-syphilitics in this group. When such an estimate is made, an inclusive prevalence rate for the entire age group may be computed.

In order to estimate the number of cases of syphilis in the "no data" group, two corrections have been made. First, there are a number of persons in the group on whom some evidence regarding the presence or absence of syphilis is available, although this evidence does not satisfy the rigid requirements set forth at the outset. For example, in the 35-39 year age group there are 19 persons known to have a negative syphilis status after they had reached the age of 30 years, although no examination had been made during or subsequent to 1939. Since the annual discovery rates for early syphilis in this community are known to be low for Negroes between 30 and 39 years of age (7.0 per 1,000 for males and 2.6 per 1,000 for females)<sup>1</sup> it seems reasonable to assume that nearly all of these persons remained free of syphilis during the few years subsequent to the recorded examination. For the same reason, the 26 persons of this age group who were found to have latent syphilis in 1940 or the first half of 1941 may be considered to have been syphilitic during 1939. In computing the corrected rates, then, the status of both of these groups has been changed from unknown to known.

The second correction was made on the basis of prevalence rates among known groups believed to be relatively homogeneous, with respect to the prevalence of syphilis, with the "no data" group. In order to make this correc-

\* Classified according to *Alphabetical Index of Occupation by Industries and Social Economic Groups*, U. S. Dept. of Commerce, Bureau of Census, 1937.

tion the entire study group was reclassified according to the type of information on which the syphilis status was based, as follows: (1) those on whom data were supplied by existing records, (2) those on whom data were obtained by subsequent examination, and (3) those on whom no information at all was available. In Table 3 the prevalence rates for classes 1 and 2, are given and the first correction noted above has been made in the "unknown" class.

per cent of the males and 56.8 per cent of the females had been so diagnosed.

On the other hand, the prevalence rates among those on whom there were no existing medical records but who were persuaded to submit to an examination, Class 2 were much lower, being for age 20-24, males 10.8 per cent and females 18.2 per cent; for ages 35-39, males 27.6 per cent and females 34.2 per cent. As far as can be determined the only variable factor between Classes

TABLE 3

*Prevalence Rates Based on Existing and Subsequently Obtained Data on Negroes Aged 20-24 Years and 35-39 Years, Eastern Health District 1939*

*(Includes Both Known and Probable Syphilis Status)*

Class	Age 20-24				Age 35-39				Total	
	Male		Female		Male		Female		Total	
	Per cent		Per cent		Per cent		Per cent		Per cent	
	Num- ber	Syphi- litic	Num- ber	Syphi- litic	Num- ber	Syphi- litic	Num- ber	Syphi- litic	Num- ber	Syphi- litic
1 Data from existing records	201	38.1	366	48.1	300	60.4	382	56.8	1,249	52.2
2 Data obtained subsequently	166	10.8	192	18.2	192	27.6	143	34.2	693	22.4
3 No data obtained	100	?	93	?	154	?	106	?	453	?
Total	467	20.3	651	34.0	646	36.2	631	42.0	2,395	33.2

It is obvious that groups for which data existed and those for which no data were obtained are not comparable because the former comprise persons who seek medical care, many of whom seek it for syphilis itself. This is reflected in the high rates for Class 1. Among the 20-24 age groups 38.1 per cent of the males and 48.1 per cent of the females had been diagnosed as syphilitic, and among the 35-39 ages, 60.4

2 and 3 is that members of the former Class were persuaded to report for examination while those of Class 3 were not. In respect to marital status, duration of residence in the Eastern Health District, employment, education, and other socio-economic factors, the two classes appeared to be homogeneous. It seemed a reasonable procedure, therefore, to apply the rates for each age and sex of Class 2 to the corresponding

TABLE 4

*Estimate of the Total Prevalence Rate for Syphilis Among Negroes Aged 20-24 Years and 35-39 Years, Eastern Health District 1939*

	Age 20-24						Age 35-39					
	Male		Female		Total		Male		Female		Total	
	Num- ber	Per cent	Num- ber	Per cent	Num- ber	Per cent	Num- ber	Per cent	Num- ber	Per cent	Num- ber	Per cent
	Non- syphilitic		Syphi- litic				Non- syphilitic		Syphi- litic			
Syphilitic	106	22.7	228	35.0	334	29.9	276	42.7	302	47.8	578	45.3
Non-syphilitic	361	77.3	423	65.0	784	70.1	370	57.3	329	52.2	699	54.7
Total	467	100.0	651	100.0	1,118	100.0	646	100.0	631	100.0	1,277	100.0

members of Class 3 in order to obtain an estimate of the number of syphilitics "expected" among the unknowns. These "expected" numbers were added to the number of known syphilitics and new prevalence rates were computed. These rates are given in Table 4 and are higher than those of Table 1 for reasons previously given. The final corrected syphilis prevalence rates for the 20-24 age groups are males 22.7 per cent and females 35.0 per cent; for the 35-39 age group males 42.7 per cent and females 47.8 per cent.

#### DISCUSSION

In prevalence studies on syphilis the accuracy of the results depends largely on two factors. The first factor is related to the selection of the group to be studied, for it should be chosen without reference to syphilis. The second factor is the manner of selection of the individuals within the chosen groups. Practically, this means that the number of persons on whom no information is available should be relatively small and that there should be some rational method of estimating the prevalence rate among them. Moreover, the accuracy of a study is further enhanced by the inclusion of those who have shown evidence of syphilis in the past as well as those who present evidence at the time of the study.

These favorable factors obtained to a degree in the present study, for an attempt was made to secure information on all persons belonging in one of two groups, selected solely on the basis of race and age. Definite data regarding syphilis were obtained on about 80 per cent of these persons and information was available which made it possible to estimate the prevalence of syphilis among the remainder.

These principles have been embodied to a varying degree in previous studies of this nature. In a review of their own and other studies Maxcy and

Brumfield<sup>6</sup> point out the limitations of serologic surveys in estimating prevalence as well as the limitation of surveys of treatment agencies and hospitals. They studied a sample comprising 40 per cent of the Negro population of Albemarle County, Va., but excluded patients examined at the University Hospital, jail inmates, and court cases. In those studies rates were based on the proportion of positives among those tested and no attempt was made to apply rates to the unknown groups, nor to inquire as to the previous syphilis status of those whose tests were negative.

Roberts and Williams<sup>7</sup> approached the matter in a somewhat similar way by applying to the unknown group the rates obtained in a random sample of a non-clinic population. However, in determining the age specific rates, clinic registrants were omitted from the analysis.

In most of these studies based on serologic surveys, a declining rate after age 35 was observed. This has been attributed to one or more of the following factors: reversal of serologic test to negative with or without treatment, a higher death rate among syphilitics, and a previously operating lower attack rate. The rates obtained in the present study, based on serologic testing and history, are from 25 to 50 per cent higher in the 35-39 age group than in the ages 20-24 among both males and females. It was not possible from this material to determine what proportion of the syphilitics had experienced serologic reversal. However, the latest test in 13 per cent of the young syphilitic group and 16 per cent of the older was negative.

#### SUMMARY

1. From an enumerated population, all Negroes aged 20-24 years and 35-39 years, were selected for study, and an attempt was made to determine the syphilis status of each.

2. From a study of existing records and from examinations made during the course of the study, minimum prevalence rates were established. These rates are as follows: ages 20-24, males 19.7 per cent, females 31.6 per cent; ages 35-39, males 33.6 per cent and females 40.4 per cent.

3. Among females of both age groups the rate for single persons was higher than for the married. The highest rate recorded was 54.4 per cent among single Negro females 35-39. The rates for males, married and single, were approximately the same within each age group.

4. Rates determined according to educational status were slightly higher among those who had not attended high school.

5. The rates were slightly higher among those unemployed than among the regularly employed.

6. The rates among skilled and semi-skilled workers were about the same as those among laborers. The servant class in all except the young males had higher rates than laborers.

7. Of the three groups, (1) existing data found, (2) examined subsequently, and (3) no data obtained, the latter two were quite similar in composition. Consequently the rates of class 2 were applied to class 3 for a final estimate of prevalence which was: ages 20-24, males 22.7 per cent, females 35.0 per cent; ages 35-39 males 42.7 per cent and females 47.8 per cent. These rates take into account the known syphilis status and the probable syphilis status of those examined, and the expected syphilis status of those not examined.

8. It is believed that the method of study employed here is susceptible of application in subsequent years, and that the prevalence

rates so obtained will afford a reliable index of the trend of syphilis in this community.

**ACKNOWLEDGEMENT**--The authors wish to express appreciation for the coöperation of Dr. Huntington Williams, Commissioner of Health of Baltimore City, and of Dr. C. Howe Eller, Director of the Eastern Health District. They also wish to acknowledge the assistance of Dr. G. F. Badger of the Department of Biostatistics, who made available for the study certain data from the files of that department. In addition they wish to express appreciation for the coöperation of the Negro physicians in the Eastern Health District.

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## IN DEFENSE OF SQUARE PEGS IN ROUND HOLES

IT is inevitable that strong and far-flung corps of amateur strategists arise whenever there are rumors of war, or war. This on the whole is probably a very good thing. It tends to maintain public interest and public morale. It creates a sort of loyal opposition to whatever is being done. It encourages map study and, of no small importance, it whiles away the time of those not immediately engaged in more productive occupations. It would be disastrous, of course, if these easy-chair and cracker-barrel plans were put to the test, and to prevent this God has wisely forbidden that the disposition of the fleet or the allocation of lend lease material should ever depend upon the decisions of those uninformed as to the whole problem and untrained in military strategy.

Because of this divine prohibition, then, it is quite safe at luncheon, temporarily to take military matters entirely out of the hands of General Marshall, and it does no harm to shift submarines and destroyers from the Atlantic to the Pacific and vice versa. But those in the medical profession and in professions complementary to it are not so far removed from the affairs of the medical corps of the services as the ordinary layman is from military strategy. Physicians are the ones who are or will be serving as strategists and tacticians in military medicine, and their criticisms of the way in which the medical services are being expanded do not always fall upon as sterile ground as does the vehemence of amateur strategists in general. One physician is influenced by the opinion of another and, unless one knows at least as much of all the problems and facts as do the Surgeons General and their staffs, it is probably not wise to take the responsibility for shaping the thoughts and actions of other physicians and the public.

Particularly harmful is the recounting of stories that imply distressing stupidity in the assignment of medical officers to duty. One hears of the plastic surgeon assigned to the examination of recruits, the laboratory man serving as regimental surgeon, the trained public health man performing sick call duty, of large numbers of medical officers twiddling their thumbs. Perhaps these things have occurred: it would be strange in so rapid a service expansion if they did not; and their occurrence would undoubtedly be distressing and discouraging to the particular

officers concerned. But does anyone imagine, if and when such things happen, that those responsible do not know they are undesirable, or imagine that every effort is not being made to prevent and correct them? One on the outside who criticises the placement of square pegs in round holes should be sure that there are not more round holes and square pegs than there are square holes and round pegs. Even if this is not the case the critic should be certain that round holes are not, at this time, a more serious problem than square ones; and he should withhold his criticism unless he is quite sure that it is better to leave round holes unfilled than it is to fill them partially with square pegs. In sounding off about medical officers not fully occupied, would the critic be willing to assume responsibility for not developing immediately, in view of future needs, a medical corps larger than is necessary to meet today's demands?

We for our part feel that these criticisms, off the elbow as it were, are to be deprecated. They tend to make physicians reluctant to offer themselves for military service, and when they do go into the medical corps, as many of them must, they may enter upon their duties with a lack of faith in their superiors. And finally, to reach decisions when all the facts are not known reflects neither mature judgment nor scientific restraint.

## MATERNAL HEALTH AND DIET

FOR a long time there has been need of substantiable data as to the beneficial effects of an adequate and balanced diet during pregnancy. It has been hard to obtain evidence of this sort and, except for sporadic and specialized bits of information here and there, the belief that diet would influence favorably both mother and child has, therefore, rested largely upon observation and general experience rather than upon controlled experiment. In the recent past, however, most encouraging advance in procuring objective findings has been made by Ebbs and his associates in the University of Toronto.

Dr. Ebbs presented a brief report of this work at the 1941 meeting of the American Public Health Association, but the publication rights to this material had been promised elsewhere. His findings, however, are of unusual interest and importance to public health workers, and those who wish to study one of his early reports are referred to the paper, *The Influence of Prenatal Diet on the Mother and Child*, which appeared in the November issue of the *Journal of Nutrition*. We are advised that other aspects of these studies will be presented, from time to time, in appropriate publications.

What Ebbs and his associates have done is essentially this: There were 380 prenatal cases, who had not reached the end of the sixth month of pregnancy, and who presented no major disease. One hundred and seventy appeared to have a reasonably good diet, and this group, designated as the "Good Diet Group," received routine care plus continuing advice as to diet. The other 210 had poor diets. Of these, 90 were provided routine care plus supplementary food necessary to provide a reasonably adequate diet. These were designated as the "Supplemented Diet Group." The remaining 120 cases had routine care but were left to their own devices and resources as to diet, and were designated as the "Poor Diet Group."

Apparently every care was exercised in an attempt to hold constant in the three groups all factors other than diet. Detailed analyses were made of each

patient's food at the beginning of the study, and were repeated two months later. Hemoglobin, vitamin C, and phosphatase were checked by blood examinations, and an obstetrical rating was given each patient in the prenatal period, during labor, and in convalescence. This rating also included condition of baby at birth, ability of mother to nurse the infant, and a rating for the whole course of pregnancy for the time each patient was under observation. Babies were examined at six months and twelve months of age, detailed records being kept. It is of interest, too, that the obstetrical ratings were made by one unfamiliar with the diet group in which patients were carried.

This description, of course, represents only the bare framework of the study. Space does not permit recounting of the various checks and counterchecks utilized to insure accuracy and avoid selection, nor is it possible to present the findings in detail. However, the author's own cautious summary, which is substantiated by tables, is extremely significant: "It would appear from these observations that poor nutrition in expectant mothers results in an increase of anaemia and infection during the prenatal period, in more sepsis and haemorrhage during labour and the puerperium and more complications during convalescence. It would also appear that the improved nutrition of these women has resulted in fewer miscarriages, permatures, stillbirths and deaths during the first months of life. There was a marked difference in the incidence of illness in the babies. This decrease in maternal morbidity, infant morbidity and mortality has resulted in less hospitalization and medical care. Whether future examinations will reveal any changes in the teeth, in physical or mental development will have to await time."

"The results of these observations seem to justify the importance which has been attached to instruction of the expectant mother in matters relating to diet. That many incomes are inadequate for providing proper nutrition is well known. Increased relief rations during pregnancy would appear to be good insurance. The cost of the food sent to the mothers in this study averaged \$25.00 per patient (for four and one-half months)."

Dr. Ebbs' conclusions are as follows: "By supplying certain simple foods to the diets of low-income expectant mothers, the incidence of complications during pregnancy was less and the outcome of the infants up to the age of 6 months was markedly improved."

Here is something definite that public health workers may well explore, both in terms of further investigations and in concrete application in the field.

# Credit Lines

A Selective Digest of Diversified Health Interests

D. B. ARMSTRONG, M.D., AND JOHN LENTZ, M.S.

## EVERY LITTLE BIT HELPS

In every office where editorial work is done one hears, with increasing frequency, talk of shortages and priorities in the publishing field. That publishers must cope with diminishing paper supplies, or inferior grades of paper, is no longer a remote possibility. There are also reports, presumably well founded, that colored inks will likewise become scarce and that certain metals used in making plates and cuts must be allocated for more vital purposes. These circumstances make it imperative for every agency utilizing printed matter to plan future publications not dependent upon the use of materials upon which the government has first call.

The production of health literature is no small item in the publishing field and the time has come when health agencies should consider ways and means of conserving paper and other publishing necessities. What about the outside back covers of your health pamphlets? An inventory of a large collection of pamphlets from various health agencies reveals that this space is almost never utilized. Why? Perhaps the writers simply ran out of something to say or else the space was left blank for esthetic reasons. It is somewhat strange that this should be true when one considers that outside back covers of magazines are eagerly sought by advertisers who are willing to pay large sums to place their copy in this space. We hereby propose—for the duration—a Society for the Full Utiliza-

tion of Outside Back Covers. Will you join up today?

There are other ways in which we can contribute to the conservation program. Writers of health pamphlets might put themselves on a word-and-space rationing basis. Boil down everything there is to say—"make every word work or fight." Then there is the matter of margins. Although wide margins and white space enhance the appearance of any publication, we can forego these luxuries in the name of war economy. As for color, health publications seldom splurge on this item. Hereafter when tempted to turn out a "two-color job," carefully consider that impulse. Black and white can be used most effectively when mixed with a dash of ingenuity. There is also the question of the size of health publications. "Vest pocket editions" might well be adopted as a uniform size for our literature until materials are again plentiful.

Perhaps we may feel that the restrictions we face will "cramp our style." It is well to remember, however, that circumstances which test one's ingenuity are often blessings in disguise. When put on short rations we may become increasingly skillful in using the tools at our disposal.

## AN EDITORIALETTE: INDIFFERENCE— THE DEADLIEST DISEASE OF ALL

For defense or for total war we cannot afford human waste—especially where it is most controllable, namely *in our civil population*. Disease and physical deficiency are wastes of the most destructive kind. To curb and eliminate them is an obvious need in

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peacetime; it is a patriotic duty in time of war. Surgeon General Parran has stated that the physical fitness of the people in this emergency "will determine almost entirely the effectiveness of all other defense efforts."

Yet it has been estimated that in our more mature age groups today, probably 70 per cent of the handicap of disease results from functional disorders or premature degenerative conditions that are preventable or readily detectable, or easily controlled or postponed in their incipency. This means an unnecessary burden upon our productivity, and an excessive load on our medical profession—a luxury which we can now ill afford, in view of the impending scarcity of professional services of all kinds.

This appears to reflect a form of negligence or indifference not only by the uninformed and underprivileged, but, more significantly, even by those with the means, the information, and the intelligence necessary to their own assistance. Most Americans, after all, have the facts about disease prevention, or know where readily to secure them.

Perhaps many of us have still to realize the importance of individual health maintenance as a patriotic obligation, especially in this time of stress. Individual health is an asset and a social contribution at all times. Now, more than ever, we owe its enhancement to ourselves and our families, to the conservation of professional resources, to the ultimate conquest of preventable disease, and to the service of our nation at war.

An understanding of the relation of individual health to national vitality will help us to a conquest of Indifference—the Deadliest Disease of All.

(EDITORIAL NOTE: Won't you help us continue this series of "editorialettes"? There must be many subjects in the field of health education upon which you would like to express an opinion. Let us have your thoughts on any of

these subjects. You may praise, criticize, or philosophize—provided it is done in not more than 150 words. While we cannot guarantee publication, serious consideration will be given your contribution.)

#### RECENT HEALTH PUBLICATIONS

You will want to see. . . .

*Trouble in the Midriff*, the latest addition (No. 5) to the Workers' Health Series. The U. S. Public Health Service has seldom produced any popular health publications that are as cleverly done as the booklets which make up this series. The most recent booklet designed for the worker deals with "stomach trouble," which "causes 20,000,000 days of lost time yearly." *Trouble in the Midriff* explains the nature of "stomach trouble" and offers sound advice to those who are victims of this "disease" in one form or another. The booklet, like others in the series, is illustrated with amusing sketches, and the light-veined, though informative, copy is a joy to read. Available from the Superintendent of Documents, Washington, D. C.

*Cracking Up Under the Strain*, a reprint from *Hygeia*, that may now be procured in booklet form from the Bureau of Health and Public Instruction of the American Medical Association, 535 North Dearborn Street, Chicago, Ill. This is a particularly timely publication, since longer hours of labor are now required and the stresses and strains of wartime are increasing. This booklet presents a thoughtful analysis of those factors that often lead man to dig his own grave. Suggested remedies for "the strenuous life" are discussed—remedies that will make for calmness, steadiness, equanimity, and relaxation. Health agencies will probably have use for literature of this type as the population faces more and more of the realities which come to a nation at war.

Single copies of this publication are sold at 10 cents and quantity prices are furnished on request.

*First in Your Thoughts*, a publication of the Maternity Center Association, 654 Madison Avenue, New York, N. Y. Health agencies are beginning to issue a new type of literature to acquaint the public with measures that must be taken during emergencies. A splendid example of emergency health literature is this leaflet from the Maternity Center Association. "You should be ready to have the baby at home" is the warning sounded in this publication. Articles necessary for the mother and baby, instructions as to how to prepare the bed, facts about labor and the delivery of the child, are among the subjects discussed for the benefit of the layman who may be forced to take over the duties of the nurse or doctor should our normal medical facilities be disrupted. This is exceedingly valuable information which all prospective parents should have—emergency or no emergency. The leaflet is priced at 50 cents per hundred copies.

*Health Is No Puzzle*, a leaflet issued by the Connecticut State Department of Health. This is a novel presentation of the nutrition problem in which certain essential foods are shown as parts of a jig-saw puzzle. When fitted together, the puzzle forms a daily food picture made up of those nutrients that insure health, vigor, and vitality. This original approach to the subject should prove most effective in teaching children elementary food facts. Address the State Health Department, Hartford, Conn., for copies.

*How's Your House?* a booklet prepared by the Philadelphia Housing Association, 1717 Sansom Street, Philadelphia, Pa. Here is an effective leaflet that will promote interest among all classes of tenants and owners in "keep-

ing the home fit." Those aspects of housing that are directly related to healthful living—sanitation, cleanliness, lighting, ventilation, and safety—are stressed in this booklet. You will like the illustrations and the text. Write to the above-mentioned organization for copies.

*Course of Lessons in Food Selection and Cooking*, prepared by the Nutrition Committee of Greater New York, 105 East 22nd Street, Room 200, New York, N. Y. This material is intended for the use of professionally trained nutritionists who teach groups in community nutrition programs. The course outlines points to be covered in six 2 hour lessons. Each lesson includes simple instruction on the nutritive value of a given food, with directions for a cooking demonstration using that food in a meal plan. Recipes for a variety of low cost foods, a reference list for teachers, and a food quiz are also included in the contents. This publication is priced at 15 cents per copy and is well worth it.

*Tuberculosis*, a new and up-to-date booklet published by the Metropolitan Life Insurance Company, 1 Madison Avenue, New York, N. Y. This publication was prepared in coöperation with the National Tuberculosis Association and the American Trudeau Society. It covers rather completely those aspects of the disease and its treatment about which the general public should be informed. Increased demands for literature on tuberculosis will no doubt be experienced by many agencies in view of recent newspaper publicity regarding the predicted rise in the tuberculosis death rate. The Metropolitan booklet is available without cost.

#### THREE FILMS

"Hidden Hunger" is the timely title of a new two-reel picture presented by the Federal Security Agency for use in the national nutrition program. As an

educational picture it is somewhat limited in scope, due to the film's short length. "Hidden Hunger" does, however, effectively stress the importance of a wide dissemination of essential nutrition knowledge and the necessity for providing the right foods for all types of people. The theme is developed along somewhat unusual lines, a fantasy approach being utilized. The picture is also well acted by a competent cast, including Walter Brennan, one of Hollywood's leading character actors. From the standpoint of its entertainment value, this picture is better than most films that are now available on the subject of nutrition. "Hidden Hunger" is, at present, for theatrical use only. Communications regarding the picture should be addressed to "Hidden Hunger," Room 401, Graybar Building, New York, N. Y.

The American Social Hygiene Association has released a new one-reel film on gonorrhea entitled, "Health Is a Victory." This is a well balanced presentation in which the facts about gonorrhea—its diagnosis, treatment, and cure—are told in simplified language. Featured in the film are several animations and diagrammatic sketches showing the prevalence of the disease, how it spreads, and how it affects the human organism. Information concerning modern methods of drug treatment and the dangers of self-medication is also stressed. There are no objectionable features to the film and it is particularly well adapted for showing to mixed audiences. "Health Is a Victory" is available in both 16 mm. and 35 mm. prints (for sale or rent) from the American Social Hygiene Association, 1790 Broadway, New York, N. Y.

Under the auspices of the First Aid, Water Safety, and Accident Prevention Service of the National Headquarters of the American Red Cross, a new four-reel film on first aid was recently released. The picture was made in

coöperation with the New York City Chapter, the staff of which appears in the cast. The film is essentially a review of certain standard first aid procedures, including the control of bleeding by digital pressure and tourniquet, methods of administering artificial respiration, transportation of the wounded, the dressing of burns and minor wounds, and other procedures now so widely stressed in first aid programs. This film does an admirable job of presenting in an understandable way many of the more important first aid procedures. Preview audiences voiced the opinion that this film could be used most effectively with students completing first aid courses under an instructor, the picture serving as an actual demonstration of first aid procedures as practised by trained workers. The film may be shown as a whole or in parts. Information concerning prints may be obtained from the Red Cross National Headquarters in Washington, D. C., or from local chapters.

#### "HEALTH IN A PACKET"

Dr. C.-E. A. Winslow, of the Yale Department of Public Health, once said: "The discovery of popular education as an instrument of preventive medicine . . . has proved as far-reaching in its results as the discovery of the germ theory of disease." Remembering this and, mindful that the health of the entire population, not just the military, is essential to national defense, even in wartime, the Health Education Section of the Council of Social Agencies of Los Angeles last year set out to acquaint the public with available health education material.

This Section, a part of the Health Division of the Council, undertook the task of assembling and effecting the distribution of the best of authoritative information covering the major field of health. The Section, consisting of a carefully selected committee of lay and

professional leaders, gathered samples of printed material, lists of motion pictures, speakers, exhibits, and posters on (1) general health, (2) maternal and child hygiene, (3) social hygiene, (4) mouth hygiene, (5) tuberculosis, and (6) other specific diseases. Individual specialists in the group studied this material and selected the best for inclusion in a large packet called "Your Health." Samples of literature and lists of additional publications, speakers, films, and exhibits were placed in separate 8" by 10" envelopes under the six titles mentioned above. Each subdividing envelope, printed in two colors, carried a line drawing suggesting its contents and a list of the material enclosed.

The educational systems of the community were the most logical channels for distribution. A packet was supplied to the Health Coördinator in each of the high schools of Los Angeles to provide ready reference on material available for health programs in the schools. Since the home plays an equally important rôle in the health education of children, the packets were supplied to the health chairmen of approximately 200 Parent-Teacher Associations in the areas served by the Council of Social Agencies. One health worker remarked after viewing the packet that the Parent-Teacher Associations had in the packet the basis for a five year program on health. Because the Parent-Teacher Associations do not include as many fathers as mothers, the Section made packets available to the health committee chairmen of the major men's service clubs, and special libraries have been given packets for deposit in their reference material on health.

The packets include, in addition to samples, lists and similar material, a simple explanation of where and how pamphlets, films, posters, exhibits, and speakers may be obtained by any group in the community.

Approximately 500 copies each of the

pamphlets included were donated by health and medical agencies and insurance companies.

#### THREE ANNUAL REPORTS

Annual reports that hold the reader's attention from cover to cover are indeed noteworthy editorial achievements. Such a report comes from the Commonwealth Fund, and if you have not yet read this agency's account of its 1941 activities, we urge you to do so. Here is a purposeful, carefully planned, and skillfully written report that succeeds remarkably well in describing the scope of the agency's work. Of special interest are those sections of the report dealing with the peculiar rural health problems which the Fund staff has done so much to solve. The final section of the report—entitled, "Saturday Morning"—creates a vivid and dramatic picture of the daily work of a county health department. One detects the rare editorial ability of Geddes Smith, of the Fund staff, throughout the 1941 report. It is a most commendable job.

Another unusually good annual report is that of the National Foundation for Infantile Paralysis, Incorporated. A very detailed account of the 1941 program is presented with pertinent facts and figures on all phases of the Foundation's work. It is interesting to note the expansion of the Foundation's educational program, which now includes grants for professional and popular educational materials, including pamphlets, periodicals, and films. This well documented report is neatly arranged, both as to layout and typography.

The Queensboro Tuberculosis and Health Association of Jamaica, N. Y., is to be congratulated on its 1941 report entitled "Three Fourths of the Way." An exceedingly simple, though pleasing, cover and distinctive stylized illustrations set this report apart from the usual run of annual statements. This report also reveals a splendid record of service



in many types of community health work.

#### JOTTINGS

In a recent issue of "Credit Lines" attention was called to the health exhibits at the Smithsonian Institution in Washington, D. C. It was pointed out that these exhibits have long been on display and that certain of them could probably be improved and modernized. It is good news to learn that something is being done in this direction by the Museum authorities, with the coöperation of the National Health Council and the U. S. Public Health Service. . . . A tip on titles: "An appropriate, interesting title for a health booklet is just as important as a good headline on an advertisement. Perhaps even more so. In the case of the advertisement, the eye may see some of the rest of the message in spite of the headline. But if the booklet title sounds dull and dry, the cover page may never be turned. One important consideration in framing a title is the idea of personalized treatment—getting in the 'you' element. The 'you' headline has won definite acceptance as one of the best approaches in advertisements." . . . Two books you will want to read: (1) *Let There Be Mercy*, by John Maloney, and (2) *This Chemical Age*, by William Haynes. The former relates the experiences of a special observer who visited the war-torn countries of Europe to survey and report upon the tragic conditions found there. This story will make every American proud of the part our Red Cross is playing in alleviating human misery. The latter book recounts the wondrous accomplishments of modern chemistry and shows how this science affects our comfort, health, and safety.

. . . Observations from Reba F. Harris, Associate Director, Bureau of Public Health Education, Kentucky State Department of Health, on films: "Very few health films really meet the needs of rural areas, particularly in the South. Yet we find, I believe, a greater use of such films in the smaller communities. One of my main objections to so many of our health films is that the films have been devoted to diseases, rather than to the total living process of human beings. In other words, we have placed the emphasis on the germ and the transmission of the disease and yet we have not shown the effects of this disease on the family and family living, nor the relationship of this family with this disease to the community in which they live. I think there is a definite need for this type of health film, particularly in the South." . . . Homer N. Calver of the American Museum of Health reports a simple method of making paper charts translucent. To the back cover of unmounted charts, apply melted camphor ice. Press this into the paper or cloth mounting of the chart with an electric iron and wipe off the excess camphor. The chart is thus made translucent, may be mounted between glass, and may be illuminated from behind by fluorescent light. The process is adaptable to all types of charts, though it is recommended that before expensive charts are treated in this manner the paper or cloth of the same type used in the chart be experimentally treated. . . . Responses to the appeal for slogans are still coming in. Dr. Lester Breslow of the Rochester, Minnesota, Health Unit submits the following: "A Healthy Nation Today—A Healthy World Tomorrow."

## BOOKS AND REPORTS

**The Anaerobic Bacteria and Their Activities in Nature and Disease.** (A Subject Bibliography.)—By L. S. McClung and Elizabeth McCoy. *Supplement I Literature for 1938 and 1939.* Berkeley and Los Angeles: University of California Press, 1941. 244 pp. Price, \$3.50.

Two volumes under the above main title first appeared in 1939, presenting approximately 120,000 entries of about 10,500 original journal articles, monographs, and other published reports, for a period of 122 years from 1816 to 1938. Volume I gave a chronological index of authors, a subject index outline with page references to Volume II, and a valuable list of abbreviations used in citing periodical references.

Volume II was arranged by subjects, the main headings being habitat, culture methods, morphology, metabolism, products of metabolism, physiology, serological studies, disease relation, classifications, and special lists, each of these being again subdivided for chronological listing. Each reference gave the author's name, his initials, the journal, volume, inclusive paging, and year, but not the title, making it necessary to refer back to Volume I to find the title of each article. This made the use of the bibliography a little cumbersome.

These criticisms are avoided in Supplement I by the inclusion of titles after the authors' names, a distinct improvement.

The same general plan is followed as in the original set, Preface, Instructions to Users, Subject Index Outline, Key to Abbreviations of Names of Journals, Section I Chronological List of References (corresponding to Volume I as published in 1939), and Section II Subject Index Sections, List of Spe-

cies of Anaerobic Bacteria, and Index (corresponding to Volume II as published in 1939).

Section I contains a total of 2,685 entries distributed as follows:

1938.....	1,231 entries
1939.....	1,057 entries
1940.....	397 entries (incomplete)

The external form and binding of the Supplement are identical with those of the original volumes and maintain the usual high standards of the University of California Press.

IVAN C. HALL

**About Ourselves**—By James G. Needham. Lancaster, Pa.: Cattell Press, 1941. 276 pp. Price, \$3.00.

In 1914 and again in 1939 we were tragically reminded that it is possible for civilized man to revert to his primitive state. The author of this book, a biologist, who also has delved into the development of man's social life, shows us that man is so much animal that for him war appears to be inevitable.

This book is written by a biologist, after many years in the laboratory and field, who has the gift of simplification that appeals to the layman. He treats of man in his biological aspects, showing that in development, structure, and function he is very much like the animal. The "brain is the chiefest of the gifts of the gods to our species" but we find it difficult to control. The driving forces in ourselves are the physiological responses necessary to keep life going. Instincts, such as fear and the preservation of the race, are deep springs of conduct derived from animals. In our social life are folkways that also have come in part from animals and are foundation stones in the social order. Ordinarily reason controls our social order but tribal instincts within and

without nations cause antagonistic groups to fight, impulses and passions become overpowering.

At the close of the book we find that religion in society is a stabilizing influence. "Government drives and organizes; religion leads and sustains."

The book has deservedly received much favorable commendation.

EDWARD C. SCHNEIDER

**The Man Who Lived for Tomorrow**—By Wade W. Oliver, New York: Dutton, 1941. 507 pp. Price, \$3.75.

This book is marked "a biography of William Hallock Park, M.D.," but a careful and eager perusal reveals that it is both more and less. On the positive side may be counted (1) a beautifully written history of diphtheria, and (2) a somewhat less impassionate account of the development of the Bureau of Laboratories of New York City's Health Department. On the negative side there is too little of the man and practically nothing of tomorrow, both of which are disappointing. One might have expected that an eminent scientist with poetical instincts (and there is only one Wade Oliver) would get around to the future in a nice flamboyant style, but one fears that his immersion in a Victorian biography may have clouded his prophetic field of vision. In most spots this volume is a mixture of worshipful and dekuifian (and why not a useful word by now?) science. William H. Park was pretty much of a human being—what a pity that realistic biographies must always be written so long after a man that what appears to be realism is only conjecture.

No review for readers of this *Journal* needs to list the magnificent accomplishments of Park, for he is a part of our times and his life is, and must remain, one of the strongest and most enduring pillars of American public health. Perhaps not to be credited with

the greatest discoveries of his time, he nevertheless possessed the courage to apply the findings of others to everyday public health—and this courage is possessed by few. Along with this courage he had the curious ability to endow all of those in his group with the type of zeal that was almost fanatical in character. One might suppose that few leaders in public health have been worshipped as absolutely as was William H. Park. The reader may search in vain in this biography for any explanation of this peculiar trait.

Oliver has omitted many things and perhaps for good reasons, but he might well have stated the part played by Park in the activities of various professional societies and in the shaping of public health standards, for these facts would have been more worth while than some of the bickerings which are included.

This is indeed a handsome book, beautifully written and beautifully manufactured. KENNETH GOODNER

**Cases of Syphilis Under Treatment—Cuyahoga County—March, 1940**—By Howard Whipple Green. Published by Joint Social Hygiene Committee of the Academy of Medicine of Cleveland and The Cleveland Health Council, 1941. 51 pp.

This is the third annual report in which cases of syphilis under treatment in Cuyahoga County (Cleveland, Ohio) during a given month are analyzed. The data are of significance mainly in relationship to those for the two preceding years.

There were 3.3 cases per 1,000 population under treatment in March, 1940, as compared with 3.8 per 1,000 in March, 1938. The rate for whites was 2.0 per 1,000 and for colored 20.6 per 1,000. Infectious cases comprised 9 per cent of the white cases and 26 per cent of the colored. The number of infectious cases decreased in whites

from 344 in 1938, to 205 in 1940, but increased in colored persons from 330 in 1938, to 441 in 1940. For the month of March, however, the number of new infectious cases among white and colored together was 181 in 1938, 161 in 1939, and 91 in 1940.

These and other data have been analyzed according to race, sex, age, and treating agency. To what extent the figures reflect real changes in the attack rate of syphilis in Cleveland is difficult to say, but it is from this type of painstaking analysis of the available data year after year that reliable evidence regarding the trend of syphilis is likely to come.

THOMAS B. TURNER

**Twelve Months of Health Defense**  
—*Edited by Savel Zimand. Annual Report of the Department of Health, City of New York, 1940. 283 pp. Price, \$1.00.*

This is an account of the activities of the Health Department of New York City for 1940 together with comparative tables on vital statistics and a review of developments since 1934. Inside the front and back covers are effective two page charts which show since 1900, the annual death rates per 1,000 population according to age groups. More detailed subsequent analysis under a heading—The Changing Picture—reveals for this city of some 7½ million persons a death rate in 1940 of 45.7 for the pneumonias, 44.5 for pulmonary tuberculosis, 3.3 for “cholera infantum,” as contrasted with rates in 1901 of 258, 228.9, and 164.1, respectively. There were only 10 deaths from diphtheria in 1940 against 2,068 in 1901 when the population was less than half as large.

The death rate in 1940 from diseases of the heart was over 3 times that of 1901, while that from cancer was over 2¼ times as high as in the earlier year, illustrating factors accompanying the

aging of the population. The decline of infant mortality to 35 per 1,000 live births and the control of acute communicable diseases represent great public health victories. But, as stated in the report, cancer, diabetes, and diseases of the cardiovascular renal group, charged with less than 25 per cent of the mortality in 1901, are now responsible for more than 65 per cent of all deaths in the city. “Some of the increase in these diseases, to be sure, is also due to improved diagnosis. Nevertheless the public health program of the future will undoubtedly have to concern itself more with these three causes of disability and death.”

Under “Seven Years of Progress” reference is made to one of the major achievements—the development of the district health center plan with a unit of department workers and services in the 30 districts of the city, each with a population of about 250,000. Other developments have included a vigorous campaign for the control of syphilis and gonorrhea, mass x-ray surveys to discover tuberculosis, reaching over 303,000 persons (with the death rate reduced by 25 per cent), the conduct of important studies, personnel training through experimental teaching centers and in-training courses, and recent necessary shifts in emphasis to meet emergency conditions.

While the statistical information in the report is extensive, much of the “meat” is presented in a concise and interesting manner in the descriptive text accompanied by 25 effective photographic illustrations of the department in action. Human interest is also added by brief quotations and lively descriptions from the service in the field and health center. Reference to specific subjects is facilitated by a carefully prepared index and a table of contents, the latter carrying among the titles: health defenses, human bookkeeping and health education, centers of public

health, and sanitary protection; and subtitles: the library with the children (referring to the child hygiene services, a pioneer organization developed in 1908), and so to school, the laboratory shows the way, our sanitary corps, and guarding the home front. The last title refers to the 900 public health nurses who every day of the year in clinics, at schools, and in homes, come directly and intimately into contact with the people. This is a stimulating report of progress, carefully planned and ably executed.

IRA V. HISCOCK

**The Volunteer in Public Health Nursing** — Prepared by Evelyn K. Davis. New York: National Organization for Public Health Nursing, 1941. 48 pp. Price, \$.50.

*The Volunteer in Public Health Nursing* should be on the desk of every director of a nursing agency and available to her staff members as well as to her board members and volunteers.

This handbook was prepared by Evelyn K. Davis, formerly assistant director of the National Organization for Public Health Nursing and now with the office of Civilian Defense for New England. She has had long experience in work with the lay person and the manual is the result of her many contacts over the country with people who want to help in the health field but lack medical or nursing training.

Miss Davis with great clarity explains why a nursing organization should use the volunteer, and where she can be made useful "so to assist the nurse that her services will go further in the community." She believes that, "a volunteer carefully selected, trained, and supervised may be made to feel a part of the organization."

A very explicit schedule of actual work in clinics, motor corps, etc., has been worked out, and directions for selection, training, and placement of volunteers will serve as a guide in the

use of a layman for any size organization. The handbook is equally important for the staff member and the student nurse as it is only their understanding of the place of the volunteer in their public health program that can make a volunteer feel part of it all.

Today, more than ever before, the appeal from all types of people is "what can I do to help in the Civilian Defense Program?" As health work is recognized as the first line of defense in this World War II, I feel that this handbook provides the answer and offers adequate solution to that question. Miss Davis's book is so full of suggestions that any director who works with volunteers whether it be in a health or a welfare agency could well afford to consult it. PRISCILLA K. THAXTER

**Toughen Up, America** — By Dr. Victor G. Heiser. New York: McGraw-Hill, 1941. 228 pp. Price, \$2.00.

Dr. Heiser's book of reminiscences, *An American Doctor's Odyssey*, had a well deserved success and gave an interesting picture of the work of a public health physician. *Toughen Up, America* deals with personal hygiene and as the title indicates is hitched to propaganda, with a not very happy result. All writers on personal hygiene are, by the nature of the case, platitudinous but few have achieved such a masterpiece of linked dullness, long drawn out, as Dr. Heiser.

The chapter openings are beacons for all future popular health writers to avoid. "Few of us escape a moment of sharp realization that we must do something about our diet." "Very few of us reach maturity without some period of sleeplessness." "We are a queer lot, we humans." Charity demands that a veil be drawn over other evidence of how banal a civilized man can be when he takes pen in hand and lets his wits drift out of the window.

Dr. Heiser records as a solemn contribution to the science of hygiene that

a doctor in Carlsbad told him, "Your skin is yellow. You have colitis." If that is typical of the medicine they practised in Carlsbad, it is well Carlsbad *delenda est*. *Toughen Up, America* has softened down Dr. Heiser.

LOGAN CLENDENING

**Microbes Which Help or Destroy Us**—By *Paul W. Allen, Ph.D., D. Frank Holtman, Ph.D., and Louise Allen McBee, M.S.* St. Louis: Mosby, 1941. 540 pp. Price, \$3.50.

This volume is evidently issued for popular consumption, but one may question its ultimate popularity, for it is too carefully written and too accurately detailed to make vivid reading. The list of subjects covered is truly amazing for a volume of only 540 pages. Practically all infectious diseases, as well as bread making, vinegar, evaporated milk, and manure, are included. One might suggest that there is some lack of balance in the treatment of various subjects and some unevenness in the amount of color found in the text. It is rather a shock to find a popular book which has avoided the journalistic style of presentation.

The volume is set in the usual clear Mosby style but the larger part is printed on a glazed paper with a greenish tint which is supposed to make reading easier but which to this reviewer is very disagreeable. Nevertheless, the volume is commendably accurate.

KENNETH GOODNER

**Preeclamptic and Eclamptic Toxemia of Pregnancy**—By *Lewis Dexter and Soma Weiss.* Boston: Little, Brown, 1941. 414 pp. Price, \$5.00.

This attractive volume represents a successful attempt to summarize and bring up to date our present knowledge of the toxemias of late pregnancy. It further includes a large amount of pertinent investigation on the part of the authors themselves. The book differs

from previous works on the subject in that it is written by and presents the point of view of the internist rather than the obstetrician. Particularly to be commended is the chapter on the nature and significance of generalized edema in normal and toxemic pregnancy. There is also a precise and impartial summary of the work which has been done in an effort to correlate endocrine imbalance with the various manifestations of toxemia. Proper emphasis is placed on prophylaxis or adequate prenatal care, on the early treatment of toxemia, and on the importance of termination of pregnancy if improvement does not soon appear. On the debit side one might wish for a more liberal presentation of the various types of modern treatment, and particularly of eclampsia. Also more space might well have been allotted to the remote effects of the toxemias as related to chronic vascular disease and in this regard many authorities will probably deprecate the section on pregnant hypertension uninfluenced by pregnancy, a phenomenon which, in the experience of the reviewer, is very rarely seen. The book is to be recommended for the investigator and specialist but is doubtless not intended for the average student or practitioner.

CHARLES H. PECKHAM

**We Need Vitamins**—By *Walter H. Eddy and G. G. Hawley.* New York: Reinhold, 1941. 102 pp. Price, \$1.50.

This book is without doubt one of the best written, concise and informative books for the laymen and non-nutritionists that have yet been published. It can be read in a few hours or in a couple of evenings. The information is accurate, up-to-date, and yet written in non-technical language which the average lay person can fully understand. Much of the text is in narrative form, that is, questions and answers, and this aids much in reliev-

ing the usual monotony of perusing scientific or technical books.

The appendix contains a very useful table of vitamin content of foodstuffs. Instead of confounding the reader by referring to half a dozen different vitamin units, the authors are very careful to give unit equivalents in every case. They also give values for the average serving. This information is of particular value to dieticians. The reviewer highly recommends this little book. It is literally packed with vitamins.

C. R. FELLERS

**Immunization to Typhoid Fever—**  
By Colonel J. F. Siler and others. *The American Journal of Hygiene Monographic Series, No. 17.* Baltimore: Johns Hopkins Press, 1941. 276 pp. Price, \$2.50.

This comprehensive report of seven years' experimental investigation by scientists of the United States Army Medical School research laboratories is an outstanding contribution to our knowledge of immunization against typhoid fever.

After a historical review of results in the preventive programs of the Army, Navy, and Civilian Conservation Corps, the authors present their experimental

studies on the influence of antigenic structure of *Eberthella typhosus* used for vaccine preparation in the production of immunity as measured by mouse protection tests. This is followed by observations on the duration of immunity and on methods of revaccination. Each phase of the investigation is discussed in detail and results are presented in a logical and orderly manner well documented with tables, sample protocols, and a series of appendices explaining details not given in the main text. The authors, in summarizing their findings, lay down criteria for selection of strains to be used for vaccine preparation and for keeping such strains in suitable condition. They recommend a continuance of the standard three dose method for initial immunization but prefer a single dose intracutaneous method for reimmunization.

There is need for more such critical studies of methods in public health practice and it is pleasant to record that the authors indicate that these investigations are to be continued by similar studies on immunization against paratyphoid fevers and consideration of problems of cross-immunization.

E. K. KLINE

## BOOKS RECEIVED

**FATIGUE OF WORKERS.** Its Relation to Industrial Production. By Committee on Work in Industry of the National Research Council. New York: Reinhold, 1941. 165 pp. Price, \$2.50.

**MODERN SANITARY ENGINEERING.** By G. Eric Mitchell. Brooklyn: Chemical Publishing, 1941. 169 pp. Price, \$5.00.

**THE DOCTORS MAYO.** By H. B. Clapesattle. Minneapolis: University of Minnesota Press, 1941. 822 pp. Price, \$3.75.

**WATER PURIFICATION FOR PLANT OPERATORS.** By George D. Norcom and Kenneth W. Brown. New York: McGraw-Hill, 1942. 180 pp. Price, \$2.50.

**FOUR TREATISES BY PARACELSUS.** Edited by Henry E. Sigerist. Baltimore: Johns Hopkins, 1941. 256 pp. Price, \$3.00.

**EVERYDAY NURSING FOR THE EVERYDAY HOME.** By Elinor E. Norlin and Bessie Donaldson. New York: Macmillan, 1942. 306 pp. Price, \$2.50.

**SO BUILD WE.** By Mary S. Gardner. New York: Macmillan, 1942. 223 pp. Price, \$2.25.

**THE BLOOD BANK AND THE TECHNIQUE AND THERAPEUTICS OF TRANSFUSIONS.** By Robert A. Kilduffe and Michael DeBakey. St. Louis: Mosby, 1942. 558 pp. Price, \$7.50.

**INTELLIGENCE, POWER AND PERSONALITY.** By George Crile. New York: McGraw-Hill, 1941. 347 pp. Price, \$3.00.

**PRE-NATAL CARE FOR FATHERS.** By John Gould. Brattleboro: Stephen Daye Press, 1941. 70 pp. Price, \$1.50.

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**Be Prepared**—Read this editorial (and some of the references) about *C. diphtheriae* gravis, the deadly form that kills despite immune serum. Except recently, in Halifax, this type hasn't made headway on this continent. But under war time conditions who can foretell when it will?

ANON. Newer Knowledge of Diphtheria Gravis. J.A.M.A. 118, 5:380 (Jan. 31), 1942.

**Our Gory-ous Fourth**—More evidence is offered through this annual compilation that legislation plus effective enforcement will reduce deaths and injuries from fireworks. The nationwide total declined handsomely in 1941, but if states which haven't them, would enact effective laws, and some other states would enforce the ones they have, the good record might be further improved.

ANON. Fifth Annual Summary of Fourth of July Injuries. J.A.M.A. 118, 1:46 (Jan. 3), 1942.

**Department of Human Genetics**—As generation of Yale students follows generation they enter younger and are heavier and taller. Half a century ago one student in 20 was over 6 feet tall. Today the 6 footers are 1 in every 5. Physicians, sanitarians, nutritionists, educators all may lay some claim to sharing in this phenomenon.

DEEGAN, W. A Forty-nine Year Survey at Yale Reveals Freshmen Are Becoming Younger, Heavier, and Taller. Research Quart. 12, 4:707 (Dec.), 1941.

**More Than Medicine is Needed**—Intimate exposure and poverty are the two conditions that most favor tuberculosis. Where they meet, double pro-

tection is needed and this implies more than free medical care and treatment. These wise words from one of our late and great public health statesmen are given new meaning by this Harlem study.

DOWNES, J., and PRICE, C. R. The Importance of Family Problems in the Control of Tuberculosis. Milbank Quart. 20, 1:7 (Jan.), 1942.

**Tuberculosis-Saboteur** — In the Navy the incidence of tuberculosis is not high, and the thorough methods employed to exclude tuberculous recruits will result in a continued decline of the disease. Fluorography with the 35mm. film is used, with a standard film retake for checking questionable cases. Tuberculosis in veterans, having cost the country a cool billion since the World War, is also a matter of concern to the Army. Draftees, generally, will have chest fluorographic examination using the 4" x 5" film.

DUNCAN, R. E. Pulmonary Tuberculosis (and) POLLOCK, W. C. Tuberculosis in the Army. Am. Rev. Tuberc. 44, 6:651 (Dec.), 1941.

**Diet Does It**—Diets of 400 women during their prenatal period were recorded. Some on poor diets were allowed to go on as controls. Others, previously poorly nourished, had their poor diets supplemented. Still others, already on good diets, were helped by education. Those on good or supplemented diets had fewer complications, were better obstetrical risks, had fewer miscarriages, stillbirths, and premature births than those on poor diets, and among the resulting infants there were fewer illnesses and deaths. This excel-



lent paper will well repay study. Don't be satisfied with this inadequate note upon it.

EBBS, J. H., *et al.* The Influence of Prenatal Diet on the Mother and Child. *Milbank Quart.* 20, 1:35 (Jan.), 1942.

**Which Tuberculin Test?**—For case finding surveys, the patch test may prove more efficient than the intracutaneous test, if the well known loss from needle shyness is taken into account; so concludes this painstaking study.

FURCOLOW, M. L. Quantitative Studies of the Tuberculin Reaction. *Pub. Health Rep.* 56, 51:2405 (Dec. 19), 1941.

**Prepared for Polio**—For a good, workman-like report of a well conceived control project to deal with an anticipated outbreak of poliomyelitis, I suggest you write for the issue of the Maryland bulletin named below. With federal aid, the health officers aimed to secure immediate and complete reporting, early hospital, or supervised home care, and competent after-care, and these aims must have been very largely achieved.

HALLIDAY, C. H. Poliomyelitis Situation in Maryland. *Maryland State Dept. of Health Monthly Bull.* 13, 9:77 (Nov.), 1941.

**Germ on Lip of the Cup**—Ignorance of sanitary procedures by managers and employees appears to be the chief cause of insanitary practices. It seems that the health engineering profession (in the city studied, at least) is not utilizing education as a tool to improve public eating and drinking places. This is the inescapable conclusion of a (Providence, R. I.) bacteriologic sampling of silver and glassware.

HORWOOD, M. P., and PESARE, P. J. The Sanitation and Bacteriology of Public Eating Utensils. *Pub. Health Rep.* 57, 2:33 (Jan. 9), 1942.

**Encouragement for Oldsters**—You will remember Osler's often misquoted crack about the unproductiveness of old-timers, even if you did not read an earlier study by the author of this paper which indicated that most creative thinking was done when the thinker was in his thirties. Now comes a study which indicates that the top of the political ladder (in any field, scientific as well as social) is most often reached by men in the late fifties.

LEHMAN, H. C. Optimum Ages for Eminent Leadership. *Sci. Month.* 54, 2:162 (Feb.), 1942.

**Page Mrs. Sanger**—Australia's long continued decline in fertility rates (the net reproduction rate has now sunk below the rate required for replacement) is evidence that declining fertility is a characteristic of new as well as old countries. It cannot be attributed to "militarism," or to democracy. Research is needed in causes and consequences.

MCCLEARY, G. F. Australia's Population Problem. *Milbank Quart.* 20, 1:23 (Jan.), 1942.

**Note for School Medical People**—Lethane in deodorized kerosene sprayed with a flit gun proves to be the most successful method of removing head lice in this Canadian experience. It is reported that no other treatment has been received with such gratification and enthusiasm by the parents.

MACHAFFIE, L. P. Pediculosis—A New Treatment. *Canad. Pub. Health J.* 32, 12:606 (Dec.), 1941.

**Diphtheria Carriers**—Children with tonsils intact are more often carriers of diphtheria than are those who have had this lymphoid tissue removed. There is much more in this continuing exploration in an old field.

MAXCY, K. F., *et al.* Diphtheria in Baltimore: Tonsillectomies as Related to the Diph-

theria Carrier Rates. *Am. J. Hyg.* 35, 1:42 (Jan.), 1942.

**Polio Flies**—Here is more proof that house flies may carry poliomyelitis virus—this time from Cleveland and Atlanta.

SABIN, A. B., and WARD, R. Flies as Carriers of Poliomyelitis Virus in Urban Epidemics. *Science* 94, 2451:590 (Dec. 19), 1941.

**Radiant Disinfection of Air**—You will want to know about this study to test the hypothesis that epidemic contagion is spread in confined atmospheres and can be controlled by radiant disinfection. It seems too bad to spoil the story by telling the results, which did support the hypothesis. Measles epidemics were much reduced as com-

pared with control rooms. Colds weren't helped—presumably because they are more often contracted in intimate outside contacts.

WELLS, W. F. The Environmental Control of Epidemic Contagion. *Am. J. Hyg.* 35, 1:97 (Jan.), 1942.

**Air, Vapor, and Oral Mucosa**—Health educators sometimes talk pretty glibly about our over-heated homes, the kiln-dried air therein, the arid nasal mucosa, and the resulting colds we enjoy. A survey of the factual data presented in this excellent paper will tend to make such hygienic pronouncements a little less pontifical.

WINSLOW, C.-E. A., *et al.* The Influence of Atmospheric Temperature and Humidity upon the Dryness of the Oral Mucosa. *Am. J. Hyg.* 35, 1:27 (Jan.), 1942.

# ASSOCIATION NEWS

## SEVENTY-FIRST ANNUAL MEETING

ST. LOUIS, Mo., OCTOBER 27-30, 1942

### Headquarters

MUNICIPAL AUDITORIUM

## APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

### Health Officers Section

Oswald De N. Cammann, M.D., New Canaan, Conn., Health Officer  
Edmond Klamke, M.D., M.P.H., Webster Health Unit, Minden, La., Director  
Walter S. Kotas, M.D., 1512 E. 22nd St., Cheyenne, Wyo., Laramie County Health Officer  
John R. Long, M.D., Perry County Health Dept., Marion, Ala., Health Officer  
Samuel N. Mallison, M.D., Butler County Health Dept., ElDorado, Kan., Director  
Raymond F. Mayer, M.D., Claiborne County Health Dept., Port Gibson, Miss., Director  
Pedro Orpi, Jr., M.D., Stop 20, Ave. Hipodromo Esq. Duarte, Arecibo, Puerto Rico, Medical Officer, Health Dept.  
Frank L. Quillman, M.D., P. O. Box 446, Apalachicola, Fla., County Health Officer, Gulf-Franklin-Wakulla Health Unit  
Paul D. Robason, M.D., 207½ E. Virginia, McKinney, Tex., Collin County Health Officer

### Laboratory Section

Norma B. Carroll, B.S., 214 West Jones, Raleigh, N. C., Senior Bacteriologist, State Laboratory of Hygiene  
Dr. Teodoro Drake, M. Ortiz 441, Redencion, Marianao, Havana, Cuba, Assoc. Bacteriologist, Children's Hospital  
Francisco J. Dy, M.D., 615 N. Wolfe St., Baltimore, Md., Asst. Instructor of Parasitology, Institute of Hygiene, Univ. of the Philippines  
Roslyn U. Fishman, B.A., 917 Ave. N., Brooklyn, N. Y., Laboratory Asst., New York City Dept. of Health  
Mildred M. Galton, M.S., 6936 Bloxham Ave., Jacksonville, Fla., Senior Bacteriologist, State Board of Health

Daniel Kaminsky, M.S., State Hygienic Laboratory, Jackson, Miss., Bacteriologist, U. S. Public Health Service  
Camille Lherisson, M.D., 46 John Brown Ave., Port au Prince, Haiti, Professor of Parasitology, National School of Medicine  
Roy S. Madden, Jr., U. S. S. Relief c/o Postmaster, New York, N. Y., Laboratory Technician. U. S. Navy  
Stanley Margoshes, M.S., 319 Medical Dormitory, Chapel Hill, N. C., Student and Assistant, Univ. of North Carolina School of Public Health  
Mollie Mollov, M.S., 150-75-87th Ave., Jamaica, N. Y., Bacteriologist, Queens General Hospital  
Charles G. Ransom, B.S., 706 Church St., Doctors Bldg., Nashville, Tenn., Consultant Bacteriologist, Davidson County Health Dept.

### Vital Statistics Section

Ruth E. Cramer, Municipal Bldg., East Liverpool, Ohio, Registrar of Vital Statistics, City of East Liverpool  
Andrew S. Wong, M.P.H., 1226 9th Ave., Honolulu, T. H., Director, Bureau of Vital Statistics, Board of Health

### Engineering Section

Robert J. Boes, M.S., 515 Huff St., Winona, Minn., Public Health Engineer  
Henry E. Breedlove, M.S., Board of Health, Mobile, Ala., Public Health Engineer  
Charles E. Carl, M.S., Jackson County Health Dept., Independence, Mo., Public Health Engineer  
Vernon B. Hammer, M.S., Des Moines County Health Unit, Burlington, Iowa, Junior Public Health Engineer, U. S. Public Health Service

Charles Haydock, B.S., Commercial Trust Bldg., Philadelphia, Pa., Consulting Engineer

Carman G. Leonard, M.S.P.H., 891 North Church St., Spartanburg, S. C., Senior Sanitary Officer, State Board of Health

Howland C. Lutz, B.S., Glen Rock, Pa., Assistant Public Health Engineer, U. S. Public Health Service

Edward N. McKinstry, B.S., 2813 Farragut St., Bremerton, Wash., Assoc. Public Health Engineer, U. S. Public Health Service

Richard F. Poston, M.S., Box 2929, Juneau, Alaska, Acting Director, Public Health Engineering, Territorial Health Dept.

Jack W. Pratt, 2589 LeConte Ave., Berkeley, Calif., Asst. Sanitary Engineer, State Dept. of Public Health

P. Edward Riley, B.S., 1800 W. Fillmore St., Chicago, Ill., Asst. Milk Sanitarian, State Dept. of Public Health

J. L. Rowland, Jr., A.B., Oak Park Health Dept., Oak Park, Ill., Chief Milk Sanitarian

James A. Sampson, B.S., Court House, Fort Dodge, Iowa, Public Health Engineer, State Dept. of Health

Maurice A. Shapiro, A.B., Area Health Office, Hinesville, Ga., Junior Public Health Engineer, U. S. Public Health Service

#### *Industrial Hygiene Section*

Forrest H. Bumford, B.S., 12 Park St., Concord, N. H., Asst. Sanitary Engineer, U. S. Public Health Service

Harry Heimann, M.D., 5402-6th Ave., Brooklyn, N. Y., Senior Industrial Hygiene Physician, New York State Dept. of Labor

Joseph Shilen, M.D., 432 South Office Bldg., Harrisburg, Pa., Director, Bureau of Industrial Hygiene, State Dept. of Health

#### *Food and Nutrition Section*

Robert O. Baird, M.S., Box 900, Bismarck, N. D., State Food Commissioner and Chemist, State Laboratories Dept.

G. LeMar Johnson, B.S., Box 103, Eaton, Ohio, Sanitarian, Preble County Board of Health

#### *Maternal and Child Health Section*

Annette V. Kitzmiller, Nome, Alaska, Public Health Nurse, Territory of Alaska

Robert M. Robbins, M.B., 155th and State Sts., Flushing, L. I., N. Y., Supervising School Health Physician, New York City Dept. of Health

#### *Public Health Education Section*

Amalia C. Baird, 211 Garfield Ave., Eau Claire, Wis., Member, State Board of Health

A. Laurence Corbman, D.D.S., 5350 Gainor Rd., Philadelphia, Pa., Staff Dentist, Children's Hospital of Philadelphia

Dr. Eli Eichelberger, 308 S. George St., York, Pa., Director of Public Health

Lyla D. Flagler, 1614 State St., Eau Claire, Wis., Teacher, Science and Home Economics, State Teachers College

Adolph E. Franke, 222 Pine St., Williamsport, Pa., Sanitarian, State Dept. of Health

Etta Mueller, Memorial Hospital, Lima, Ohio, Superintendent of Nurses

Maurine G. Muller, A.B., 1554-28th Ave., San Francisco, Calif., Clerk, Welfare Division, Metropolitan Life Ins. Co.

#### *Public Health Nursing Section*

Ruth Addams, R.N., B.S., 1307 Spruce St., Philadelphia, Pa., Public Health Nurse and Instructor, The Presbyterian Hospital

Grace Anderson, R.N., R.F.D. 1, Titusville, N. J., Territorial Supervisor of Nursing, Metropolitan Life Ins. Co

Mildred J. Davis, 35 State St., Batavia, N. Y., Supervising Public Health Nurse, State Dept. of Health

Ruth Freeman, R.N., M.A., 95 N. Lexington Ave., St. Paul, Minn., Director of Course in Public Health Nursing, Univ. of Minnesota

Wilma E. Gross, R.N., Mt. Sterling, Ill., District Unit Nurse, Dept. of Public Health

Rose Guralnick, M.A., R.N., P. O. Box 356, Seward, Alaska, Public Health Nurse, Seward Public Health Service

Hilkea Jacobs, B.S., C.P.H., Cobblestone Apts., Kemmerer, Wyo., Supervisory Nurse, State Dept. of Health

Hazel F. Kandler, R.N., B.S., Rt. 1, Box 640, Tucson, Ariz., Supervising Nurse, Dept. of Health

Marcelle Kelly, M.A., 2101 Adelbert Rd., Cleveland, Ohio, Staff Nurse, Maternal Health Assn.

Bivion L. Kimbrell, R.N., A.B., 1053 Madison Ave., Memphis, Tenn., Local Supervisor, Metropolitan Life Ins. Co. Nursing Service

Enid Mathison, B.S., DeFuniak Springs, Fla., County Nurse, State Board of Health

Margaret M. McCulloch, 415 S. Fifth Ave., Apt. 2, Ann Arbor, Mich., Public Health Nurse Trainee (New Mexico State Public Health Dept.)

Fannie A. Munroe, Quincy, Fla., Staff Nurse, Gadsden County Health Dept.

Esther Putnam, R.N., Bannock County Health Unit, Pocatello, Ida., School Nurse

Rose Wendrow, Health Dept., Chicopee, Mass., Public Health Nurse, Chicopee Health Dept.

Margaret C. Wolcott, M.A., 530 West Water St., Elmira, N. Y., Supervising Public Health Nurse, State Dept. of Health

Margaret Young, B.A., Irwinville, Ga., Project Nurse, Irwinville Farms, Farm Security Administration

*Epidemiology Section*

Lynne E. Baker, M.D., Florida State Board of Health, Jacksonville, Fla., Director, Division of Tuberculosis

I. Jay Brightman, M.D., Fuller Gardens, Ossining, N. Y., Consultant, Division of Syphilis Control, State Dept. of Health

Abe A. Goldman, M.D., Cumberland Hospital, 39 Auburn Place, Brooklyn, N. Y., Interne, New York City Dept. of Hospitals

David Reisner, M.D., 17 E. 96th St., New York, N. Y., Medical Supervisor, Bureau of Tuberculosis, Dept. of Health

*Unaffiliated*

William Bolt, M.D., C.M., 51 Madison Ave., New York, N. Y., Medical Director, New York Life Ins. Co.

Stephen Cahana, M.D., 152 W. Wisconsin Ave., Milwaukee, Wis., Vice President, Wisconsin State Board of Health

Arthur S. Lynn, Aulston Ave. Ext., Durham, N. C., Trainee in Public Health, Univ. of North Carolina, School of Public Health

Irwin Rothman, V.M.D., 2233 N. 18th St., Philadelphia, Pa., Veterinarian, U. S. Dept. of Agriculture

DECEASED MEMBERS

Justus Goslau, M.D., Cedar Grove, N. J., Elected Member 1938, Laboratory Section

Clifford B. Line, D.V.M., Lansing, Mich., Elected Member 1940, Laboratory Section

## EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearing house on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

### U. S. CIVIL SERVICE COMMISSION

The U. S. Civil Service Commission, Washington, D. C., announces unassembled examinations for Home Economists in 5 different grades at \$2,600 to \$5,600 a year. Interested persons should apply to the Commission for Circular 195 on Home Economics.

**Junior Public Health Nurse.** A civil service examination for Public Health Nurse (\$2,000) has been open for some time. Nurses who have been unable to qualify for this examination because of the experience requirement now have an opportunity to qualify through a new Junior Public Health Nurse examination (\$1,800) which requires no experience. Applications are also being received for examinations now open for Junior Graduate Nurse (\$1,620) and Graduate Nurse for general staff duty (\$1,800). Further information and application forms may be obtained at any first or second class post office or from the Civil Service Commission, Washington.

### POSITIONS AVAILABLE

**County Public Health Nurses for New Mexico.** Must have four months' post-graduate instruction under one of the recognized public health nursing courses and one year's experience. Must drive and have a car. Address inquiry to State Health Department, Santa Fe, N. M.

**Physician with either public health training or experience in local health department administration to serve as health director in a county health department in mid-western state.** Salary \$4,000 and \$500 travel (flat rate). Well established department with offices in attractive little city of 10,000. Write Box T, Employment Service, A.P.H.A.

**Wanted: Trained Public Health Nurse,** starting salary \$1,500 per year and traveling expense, increase to \$1,700 within 6 months. Saginaw County Health Department, Saginaw, Mich.

The State Department of Social Security and Welfare, Crippled Children's Division, of Phoenix, Ariz., has three vacancies to be filled. Examinations will soon be held for orthopedic nursing consultant, nurse-physical therapist, and medical social worker.

Further information may be obtained by writing to the Merit System Supervisor, Room 208, 128 North First Avenue, Phoenix, Arizona.

### PHYSICIANS WANTED IN CINCINNATI

Carl A. Wilzbach, M.D., Commissioner of Health of Cincinnati, has announced that there are vacancies for white male

physicians, aged 23 to 50, graduates of recognized colleges of medicine, licensed to practise in Ohio, for appointment to the Cincinnati Health Department. Duties include surveillance over communicable disease, infant and child welfare work, medical service for sick poor, epidemiological surveys of communicable disease, examinations for work certificates, school teachers, etc., vaccination, medical school inspection. Salary \$2,640 to \$3,360 plus transportation allowance of \$240 per annum. Eligible for a retirement system. Persons interested should communicate with Dr. Wilzbach, Commissioner of Health, City Hall, Cincinnati, Ohio.

### PUBLIC HEALTH ENGINEER

Responsible professional public health engineering involving field investigations and office studies in the application of sanitary measures. The more difficult engineering and sanitation field surveys include supervision over public water supplies, sewerage systems and sewage treatment plants and review of plans for same, and promotion and supervision of sanitation programs. Minimum qualifications: Training and experience equivalent to 3 years' civil engineering experience, including 2 years in public health or sanitary engineering; or completion of an academic year of graduate study and a year's experience in sanitary or public health engineering; and graduation from a college of recognized standing with a major course in civil or sanitary engineering. The salary range is \$205 to \$250 per

month depending upon experience. Apply Box E, Employment Service, A.P.H.A.

Southwestern State Health Department seeks 2 physicians for assignment to district health units, personally to conduct several small venereal disease clinics on a rotating schedule. Experience preferred but not required. Salary \$3,000, plus actual travel allowance not to exceed \$1,200. Write Box V, Employment Service, A.P.H.A.

Middle western city, 125,000 population, seeks well trained and experienced Health Officer on full-time, with competence to administer a department and teach public health to medical students. Salary \$5,000 to \$5,500 per annum. Write Box K, Employment Service, A.P.H.A.

Bacteriologist, M.S. or Ph.D., with 3-5 years' applied experience in the field of sanitation and disinfection, wanted by prominent eastern manufacturer for re-

search and development work. Creative ability must be established. Consideration will be given only to those who fully meet the above requirements. In replying give full academic, industrial and personal background. Transcript of academic record, scientific and personal references, and recent photograph will be requested. Write Box P, Employment Service, A.P.H.A.

The New Mexico State Department of Health will consider applications for the position of Assistant Director of the Maternal and Child Health Division and for Dental Health Consultant of that Division. Address inquiries to the State Department of Public Health, Santa Fe, N. M.

Instructor in Bacteriology. Medical School, large midwestern university. M.D. (or Ph.D. or D.Sc. in Bacteriology); Male. Salary \$1,800 to \$2,500 according to age and experience. Write Box D, Employment Service, A.P.H.A.

## POSITIONS WANTED

### ADMINISTRATIVE

Teaching or administrative position desired by physician, aged 48. Experienced teacher in preventive medicine and public health, now employed at prominent medical school. Twenty years' experience in municipal health administration and epidemiology. A-491.

Physician, M.D. Tulane, M.P.H. Johns Hopkins, age 31, experienced as health unit director, prefers administrative position in the South. A-488

Physician, age 32, 5 years clinical and administrative experience in venereal diseases, wishes administrative position in venereal disease control, preferably at state level. A-490

### HEALTH EDUCATION

Teacher and research worker, man, Ph.D., age 52. Extensive record as college professor of biology and hygiene and investigator, for the past two years engaged in research. H-499

Health Educator, Negro, man with background of High School administration and M.S.P.H. from Michigan, seeks position in Health Education. Public agency or educational field. Excellent references. H-497

Woman, M.S. in public health, excellent graduate training in education, 8 years' experience as business executive (sales and publicity). Just completed year's research in community education. Seeks good administrative position. H-496

Health Educator, M.A. in Education, 10 years' background in community organization for public health education, also teaching of personal and community health at high school and college levels. Public health nurse, able to teach mental and social hygiene as well as general health education. East preferred. H-498

Health Educator. Man with M.S. in preventive medicine and public health. Negro. Seeks position in Health Education or field work with official or non-official agency. H-500

Woman with master's degree in health education, 12 years' successful experience in public school and college teaching, administration and research. Will consider position in normal school, public schools, or in official or nonofficial health agencies. Prefers South or East. Available at once. H-501

### LABORATORY

Milk Sanitarian and Technologist, age 37, Ph.D. Bacteriology, Wisconsin, 10 years' experience in milk and food sanitation from industrial and official angle, seeks administrative position with opportunity for research or investigational work preferred. L-381

Chemist, Sc.D., Biochemistry, Johns Hopkins University. Age 31. Public health laboratory experience, teaching experience. Desires position with promise of advancement, preferably in commercial organization. L-461

Bacteriologist, young man, 28, with B.S. in industrial science, experienced in newspaper work, salesmanship and now employed in a state department of health laboratory, seeks position as bacteriologist or doing promotional work of public health nature. L-465

#### SANITARY ENGINEERING

Public Health Engineer, M.S. Harvard, experienced in public health and industrial hygiene, wishes position of better sort in public health engineering or industrial hygiene. E-470

#### STATISTICAL

Woman with academic, business and research experience in vital statistics, seeks a position in the vital statistics division of a state or city health department, preferably as registrar. S-459

Experienced and well trained public health nurse, with background of tuberculosis, venereal disease, school, industrial, and generalized services, will shortly be available for appointment. Three years as director of state nursing service. Experienced as university teacher of public health nursing. M.A., New York University. M-449

#### Advertisement

## Opportunities Available

**PUBLIC HEALTH PHYSICIANS**—(a) City health officer; college and industrial town of 25,000; woman physician eligible; around \$4,000. (b) County health officer; opportunity for extensive private practice in rural area; estimated monthly income, around \$500; Washington State. (c) Field epidemiologist, division of venereal disease control; eastern state. (d) County health director; special public health training not required; \$4,600, including automobile allowance; Oklahoma. (e) Assistant director, division of maternal and child health; postgraduate training obstetrics required; woman physician eligible; West. (f) City-county physician; full-time appointment in fairly large town; Georgia. PH3-1, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

**PUBLIC HEALTH NURSES**—(a) Public health nurse with background of experience in tuberculosis nursing to carry on tuberculosis control work; county appointment; \$150, transportation in county car furnished; Pacific Coast. (b) For appointment in clinic of 300 bed hospital; duties will include

supervision of student nurses giving visiting nurses' service in homes; South. (c) County health appointment; duties include general public health nursing, some obstetrical delivery service, small amount of social service work; Midwest. (d) Assistant supervisor of school nurses; supervision will extend to both educational and field work; \$1,800, transportation allowance; headquarters will be in central city of 300,000. PH3-2, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

**BACTERIOLOGISTS**—(a) Bacteriologist-serologist; excellent Chicago hospital; degree, personal interview required; \$150, partial maintenance, increasing. (b) Junior bacteriologist for large hospital serving training camp; enthusiasm more important than extensive experience; around \$1,500, traveling expenses to field. (c) Assistant bacteriologist-serologist, city laboratory; duties include assisting in serology, milk, water and restaurant bacteriology, general bacteriology; \$1,500, to begin; ample opportunity for advancement; New York State. PH3-3, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

#### Advertisement

## Situations Wanted

**INDUSTRIAL HYGIENIST**—B.S., M.D., eastern schools; M.P.H., Harvard School of Public Health; municipal health physician, two years; several years, assistant director, state industrial hygiene bureau. PH3-4, Medical Bureau (Burneice Larson, Director) Palomolive Building, Chicago.

**PUBLIC HEALTH PHYSICIAN**—A.B., state university; M.D., Harvard; M.P.H., Johns Hopkins School of Hygiene and Public Health; graduate training in pediatrics before specializing in public health medicine; six years, assistant commissioner, metropolitan health department. PH3-5, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

**PUBLIC HEALTH NURSE**—B.S. and M.S. degrees in administration in public health nursing, eastern university; active in public health administration for many years; keenly interested social problems; now educational director visiting nurse association. PH3-6, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

**BACTERIOLOGIST**—Desires position, preferably in public health laboratories; B.A., eastern school; C.P.H. and Ph.D. (bacteriology), Yale University; has done considerable research; four years, bacteriologist and research technician, public health laboratories. PH3-7, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.



## NEWS FROM THE FIELD

### PUBLIC HEALTH NURSING IN HONOLULU EMERGENCY

**S**UPPLEMENTING the account carried in February *Journal* of the activities in the Territorial Board of Health during the recent emergency in Hawaii, Mary Williams, R.N., the Director of the Bureau of Public Health Nursing of the Territorial Board of Health, writes that the Board had long planned for essential health measures in an emergency and was in active service immediately. Prompt and efficient communicable disease control measures were instituted and every assistance in medical, sanitary, and nursing aid was given to the military and civil authorities.

"A number of Board of Health nurses got into active service the first few hours and days in hospitals and first-aid stations, but were released to their regular jobs as soon as possible. Perhaps one of our most important services was out in the field reassuring families and particularly maternity patients. Every one of these was visited, plans for delivery were checked, and provision made for hospital or home care. Nurses were on 24 hour call for any emergency home cases. We had the necessary official passes, automobiles, gasoline, and equipment to go anywhere. We were able to give assistance to the evacuees as families were moved immediately from danger zones and housed in public buildings. Subsequent evacuation orders in certain areas have continued this work."

### WESTERN BRANCH, A.P.H.A., TO MEET IN SEATTLE

**W** FORD HIGBY, Secretary of the Western Branch of the American Public Health Association, has announced that the Branch will meet

in Seattle, May 26 to 29 inclusive, with headquarters at the Hotel Olympic. The first day, Tuesday, May 26, will be reserved for meetings of affiliated groups.

Dr. Adolph Weinzirl of the University of Oregon Medical School, Portland, is Chairman of the Program Committee.

### COURSE OF LECTURE CONFERENCES ON HEALTH EDUCATION IN NEW YORK

**T**HE Welfare Council of New York City through its Health Education Section has announced a course of lecture conferences on the scientific foundation of health education. The course is arranged for health educators of New York City by the Subcommittee on Scientific Sessions of the Health Education Section. Dr. Iago Galdston is Chairman, Hazel Corbin and Lucy Gillett are members of the committee.

The January lecture was by Dr. J. B. Youmans of Vanderbilt University Medical School, Nashville, Tenn., on Nutrition and Health Education. The February lecture was by Dr. John Romano of the Harvard Medical School, Boston, on Mental Hygiene.

The three forthcoming sessions are listed below. The conferences are to be held at the New York Academy of Medicine, 2 East 103rd Street, New York, N. Y. 3:30 to 5 P.M. on the dates indicated. Cards for admission to the series may be secured by addressing Dr. Galdston at the Welfare Council, 44 East 23rd Street, New York, N. Y.

March 25—Dr. Bernhard J. Stern, Department of Sociology, Columbia University, New York, N. Y.—Sociology.

April 30—Philip Lennen, President, Lennen & Mitchell, New York, N. Y.—Instrumentalities of Education and Propaganda.

May 28—Dr. Perrin Long, Johns Hopkins University, Baltimore, Md.—Hygiene—Public Health.

#### VITAMIN D VALUE OF SUNLIGHT IN VARIOUS CITIES

THE Wisconsin Alumni Research Foundation of Madison, Wis., announces the publication of a new chart entitled "Facts Regarding the Vitamin D Value of Sunlight in Your City." Concise information is available on clear days and hours of sunshine for each month for 67 cities in the United States. Single copies will be sent free upon request.

#### NATION-WIDE IMMUNIZATION CAMPAIGN

ELSEWHERE in this issue the Child Health Day proclamation by President Roosevelt focuses the attention of the public on the desirability of having all children in the United States immunized against smallpox and diphtheria. Sponsoring this campaign are the Conference of State and Provincial Health Authorities of North America and the Children's Bureau of the U. S. Department of Labor. The Office of Education, the Public Health Service and state and local health departments and the public schools throughout the nation are expected to cooperate. Main emphasis is placed upon diphtheria and smallpox but it is pointed out that physicians in some areas will also advise immunization of children against whooping cough, tetanus, or typhoid.

Pointing out that there were almost 17,000 cases of diphtheria in 1941, Dr. Martha M. Eliot, Associate Chief of the Children's Bureau, emphasized the fact that neglect of these life-saving preventive measures now takes a heavy toll in illness and death of children. Dr. Eliot expressed the opinion that only by continuing to apply our knowledge of vaccination can we prevent smallpox from returning in the form of virulent epidemics. She noted that in 1941 there were 1,368 reported cases of smallpox in the United States. Dr. Eliot referred to the widespread shifts of

population that result from the mobilization of fighting men and of the labor army and which are apt to increase the hazards of disease. It is therefore more urgent than ever, she said, in this wartime period, and in view of the prospective shortage of doctors and nurses in many communities, to protect the army and industries from the dangers of these diseases so common among children.

The aim of the program is to extend the immunization to 100 per cent of children beyond 9 months of age by May 1, Child Health Day, 1942.

#### MEDICAL VISITORS FROM CHILE

NINETEEN Chilean physicians are in the United States visiting medical and public health facilities under the guidance of Dr. Hugh S. Cumming, the Director of the Pan American Sanitary Bureau, Washington.

Nine of these physicians have spent considerable time in Michigan as guests of the W. K. Kellogg Foundation, the Detroit Department of Health, and the University of Michigan. They have also visited the Board of Health of Chicago and have recently been to Cincinnati and Nashville. Their special interests are pediatrics, tuberculosis, and maternal health. They are health officers in their districts under the national insurance plan in Chile.

These men include:

Dr. Honorio Aguirre  
Dr. Victor Sierra  
Dr. Oscar Illanes  
Dr. Jorge Abasolo  
Dr. Manuel Marin  
Dr. Pedro Martini  
Dr. Raul Cantuarias  
Dr. Luis A. Diaz  
Dr. Gabriella Duco

#### HEALTH CONGRESS IN MEXICO

SCIENCE announces that the first Mexican Congress of Internal Medicine will be held in Mexico City from May 3 to 10, under the aus-

pices of the President of Mexico and the Departments of Education and Public Health, with the coöperation of the medical societies of Mexico and the National University.

DR. BAEHR APPOINTED TO HEALTH AND  
MEDICAL COMMITTEE

PRESIDENT Roosevelt has appointed Dr. George Baehr, Chief Medical Officer of the Office of Civilian Defense, to be a member of the Health and Medical Committee of the Office of Defense Health and Welfare Services. Dr. Irvin Abell, Louisville, Ky., chairman of the Committee on Medical Preparedness of the American Medical Association, is chairman of the Health

and Medical Committee, and other members are the Surgeon General of the U. S. Army, Major General James C. Magee; the Surgeon General of the U. S. Navy, Rear Admiral Ross T. McIntire; the Surgeon General of the U. S. Public Health Service, Dr. Thomas Parran, and the chairman of the Division of Medical Sciences, National Research Council, Dr. Lewis W. Weed, Baltimore. The Office of Defense Health and Welfare Services is a part of the Office for Emergency Management which in turn is part of the Executive Office of the President. The director of the ODHWS is Paul V. McNutt, who is also Federal Security Administrator.

CHILD HEALTH DAY—1942

BY THE PRESIDENT OF THE UNITED STATES OF AMERICA  
A PROCLAMATION

WHEREAS, the Congress by joint resolution of May 18, 1928 (45 Stat. 617), has authorized and requested the President of the United States to issue annually a proclamation setting apart May 1 as Child Health Day:

NOW, THEREFORE, I, FRANKLIN D. ROOSEVELT, President of the United States of America, in recognition of the vital importance of the health of children to the strength of the Nation, do hereby designate the first day of May of this year as Child Health Day.

And I call upon the people in each of our communities to contribute to the conservation of child health and the reduction of illness among children by exerting every effort to the end that before May Day, Child Health Day, children over nine months of age be immunized against diphtheria and smallpox, the two diseases for which we have the surest means of prevention.

IN WITNESS WHEREOF, I have hereunto set my hand and caused the seal of the United States of America to be affixed.

DONE at the City of Washington this sixth day of February in the year of our Lord nineteen hundred and forty-two and of the Independence of the United States of America the one hundred and sixty-sixth.

FRANKLIN D. ROOSEVELT

(SEAL)

By the President:  
CORDELL HULL  
Secretary of State.

## DENTAL HEALTH

THE National Dental Hygiene Association on February 1 brought out its first edition of a new quarterly magazine entitled *Dental Health*, devoted to the promotion of increased public participation in each community in dental health education and treatment programs and to news of dental health accomplishments in individual cities and towns.

The editorship of the magazine is in the hands of Randolph G. Bishop, Editor; Paul E. Morgan, Managing Editor; and Cullison Cady, Associate Editor. Editorial offices are Room 934, Shoreham Building, Washington, D. C. NOTE: Review copies of *Dental Health* will be mailed upon request.

## TWELFTH NEW ENGLAND HEALTH INSTITUTE

EDWARD A. McLAUGHLIN, M.D., Executive Chairman, has announced the Twelfth New England Health Institute to be held in Providence at the Biltmore Hotel, April 21 to 23.

The New England Health Institute is held under the sponsorship of the State Departments of Health of Maine, Vermont, New Hampshire, Connecticut, Massachusetts, and Rhode Island. The Sponsoring Committee consists of Edward A. McLaughlin, M.D., *Chairman*, Roscoe L. Mitchell, M.D., Charles F. Dalton, M.D., Travis P. Burroughs, M.D., Stanley H. Osborn, M.D., and Paul J. Jackmauh, M.D. Further information can be obtained from the Institute at 317 State Office Building, Providence, R. I.

## NEW GRADUATE COURSE IN INDUSTRIAL HYGIENE AND MEDICINE

FRED J. WAMPLER, M.D., Professor of Preventive Medicine in the Medical College of Virginia, Richmond, has announced a graduate course in industrial hygiene and medicine cov-

ering one, two, or three months' duration.

The course will be offered by the Medical College of Virginia in coöperation with the Bureau of Industrial Hygiene of the Virginia State Health Department, the Industrial Commission of Virginia, the State Department of Education, and the medical departments of several industries in and around Richmond.

The course will cover field experience in the medical departments of two or more industries, work with the State Health Department Bureau of Industrial Hygiene in a survey of an industrial plant and in a laboratory, time with the Industrial Commission in study of compensation setup and problems, time with the Division of Rehabilitation of the State Department of Education and lectures, seminars, discussions and assigned readings on compensation laws, casualty insurance, morbidity and mortality reporting, statistics of industrial employment, special disease control programs in industries, labor's attitude toward medical programs, and the position of the industrial nurse in the medical program.

The tuition for the course will be \$50 for the first month, and \$25 for each succeeding month. Instruction will begin at any time after arrangements with the college.

## PERSONALS

## Central States

HENRY H. ASHER, M.D.,† who for the past 2 years served as County Health Officer in Sedgwick County, Kans., has taken over the position of Director of the Division of Local Health Services with the Kansas State Board of Health at Topeka.

FRANK J. HILL, M.D.,† of Bismarck

\* Fellow A.P.H.A.

† Member A.P.H.A.

has been appointed acting State Health Officer of North Dakota, to succeed MAYSIL M. WILLIAMS, M.D., C.P.H.,\* who has resigned to become District Health Officer in the New York City Department of Health.

B. RUSSELL FRANKLIN,† Sanitarian with the Ingham County Health Department in Michigan, has been appointed Chief Sanitarian of the Lorain County District Department of Health, Oberlin, Ohio.

HARRIET FULMER, R.N.,\* resigned March 1 from the Rural Nursing Service of Cook County, Ill. Miss Fulmer, who at the time of her retirement was supervisor of nurses in the Public Health Unit, Chicago, has completed 25 years in this position.

THEODORE G. KLUMPP, recently appointed Secretary of the Council on Pharmacy and Chemistry of the American Medical Association, Chicago, has resigned to become President of the Winthrop Chemical Company, Inc., New York, N. Y.

ARTHUR B. REAM, M.D., of Mechanicsburg, Ohio, has been appointed Health Commissioner of Clermont County.

GEORGE M. SHINERS, M.D., Green Bay, Wis., has been appointed Health Commissioner of Green Bay.

WILLIAM E. SOVIK, M.D., has been appointed Health Officer of Campbell, Ohio, succeeding DR. EDWARD J. REILLY.

JOHN W. TURNER, M.D.,† formerly Health Officer of Marion County, Kans., has been appointed Health Officer of Sedgwick County, succeeding DR. HENRY H. ASHER.†

#### Eastern States

THOMAS J. BERGIN, M.D.,† Cos Cob, Conn., has been appointed full-time Health Officer of the town of Greenwich.

ALBERT E. CHILDS, M.D., of Litchfield,

Conn., has succeeded ELTON R. SKILTON, as Health Officer of Morris.

L. A. MACLEAN, M.D., D.P.H., recently of Massachusetts, has been appointed County Health Officer of Monongalia County, W. Va., and Director of the West Virginia Public Health Training Center at Morgantown. He succeeds DR. E. G. MCGAVRAN, now the Health Officer of St. Louis County, Clayton, Mo.

HUBLEY R. OWEN, M.D.,† Philadelphia, Pa., resigned as Chairman of the Council of Defense to give full time to his work as Director of Public Health.

ERNEST R. PENDLETON, M.D., has been appointed Health Officer of East Granby and Hartland, Conn., succeeding respectively, DR. ADOLPH VIETS, and DR. EDWARD A. GAYLORD.

PHILIP E. SCHWARTZ, M.D., has been appointed Health Officer of Portland, Conn., succeeding DR. JOHN R. TARRANT.

#### Southern States

BURTON F. AUSTIN, M.D.,† of Montgomery, Ala., Chief of the Bureau of Hygiene and Nursing of the State Department of Health, has been appointed Acting Health Officer of Alabama, pending a permanent selection to succeed the late JAMES N. BAKER, M.D., Montgomery.

RALPH L. BEST, M.D., Drumright, Okla., has been made Health Officer of Green County, with headquarters in Eutaw.

THOMAS O. COPPEDGE, M.D.,† Nashville, N. C., is now Health Officer of Nash County.

JESSE M. DISHMAN, M.D.,† of Princeton, Ky., Health Officer of Caldwell County, has been appointed Health Officer of Fulton County, succeeding LAYSON B. SWANN, M.D., of Paducah, who resigned to enter the army.

FREDERICK EBERSON, M.D., Ph.D.,\*

formerly Pathologist and Director of Laboratories, Gallinger Hospital, Washington, D. C., has been appointed Medical and Research Director, National Drug Company, Philadelphia, Pa.

CORINNE S. EDDY, M.D.,<sup>†</sup> Centerville, Ala., has been appointed Health Officer for Bibb County. Dr. Eddy was formerly connected with the unit in Cleburne County.

FRANK L. LAPSLEY, M.D., Shelbyville, Ky., has been reelected Health Officer of Shelby County for a four year term.

LEO B. SKEEN, M.D., Sanatorium, N. C., has been named Health Officer of Iredell County.

VERNON W. TAYLOR, JR., M.D., of Madison, N. C., has been appointed Assistant Medical Director of the city hospital system of Winston-Salem, a position recently created because of an expanded program of public service.

WARREN T. VAUGHAN, M.D., of Richmond, Va., was awarded the honorary degree of Master of Science by the University of Michigan, Ann Arbor.

CLIFFORD E. WALLER, M.D.,\* Silver Springs, Md., formerly Medical Director, U. S. Public Health Service, has been appointed Health Officer of the newly organized Health Department in Loudoun County, Leesburg, Va.

#### Western States

HARRY J. ANDERSON, M.D., of Corvallis, Ore., has been named Health Officer of Benton County, succeeding Dr. WILLIAM T. JOHNSON, who held the position for many years.

AMOS CHRISTIE, M.D.,<sup>†</sup> has been appointed Assistant Director of Medical and Health Service for the American Red Cross as announced by National Headquarters. Dr. Christie, who is

a member of the California State Board of Health, has been Associate Professor of Pediatrics at the University of California, San Francisco, from which institution he received his M.D. degree in 1929. He will be associated with ALBERT McCOWN, M.D., Dr.P.H.,\* Director of Medical and Health Service.

CLARENCE R. E. LINDGREN, M.D., of Eugene, Ore., has been appointed Health Officer of Lane County.

EMIL E. PALMQUIST, M.D.,<sup>†</sup> Colfax, Wash., Health Officer of Whitman County, has been granted 6 months' leave of absence to study health administration at the University of Michigan, Ann Arbor. During his absence DR. PHILIP J. HOLABACH, Colfax, will be Health Officer.

JEAN G. ROBERTS, R.N., has been appointed Pacific Coast Nursing Supervisor of the Metropolitan Life Insurance Company Pacific Coast Head Office, San Francisco, succeeding Helen LaMalle who has retired. Mrs. Roberts has been Territorial Supervisor with the Metropolitan for the past two years.

RUSSELL H. WILSON, M.D., of Bremerton, Wash., has been appointed in charge of the Kitsap County Health Department, succeeding Dr. HAROLD M. GRANING, who was assigned to the Plague Laboratory of the U. S. Public Health Service at San Francisco.

#### Canada

G. W. MILLER, M.D., D.P.H., has been appointed Principal Medical Officer of the Royal Navy in India and of the Royal Indian Navy. Dr. Miller is a graduate of the University of Toronto and received his diploma in public health in 1936. He was formerly Deputy Public Health Commissioner with the government of India.

## DEATHS

ALBERT E. AUSTIN, M.D., former Health Officer for 20 years of Greenwich, Conn., died on January 26 at the age of 64. He was President of the Old Greenwich Trust Company, a practising physician, and from 1939 to 1941 was Representative from the 4th Connecticut District in Congress.

H. C. BROWN, M.D., Health Officer of the City of San Jose, Calif., died on December 30, 1941.

SAMUEL W. LAMBERT, M.D., Dean of the College of Physicians and Surgeons of Columbia University, New York, N. Y., 1904-1919, and a former President of the New York Academy of Medicine, died on February 10.

PROFESSOR MERRILL J. MACK, Dairy Industry Specialist of Massachusetts State College, Amherst, died on February 9 following an operation, at the age of 39. Dr. Mack became a member of the Association in 1928 and a Fellow in 1933. He was identified with the Food and Nutrition Section.

## CONFERENCES AND DATES

American Academy of Pediatrics—Region I. Hotel Bellevue-Stratford, Philadelphia, Pa. April 1-3.

American Academy of Political & Social Science. Philadelphia, Pa. April 10-11.

American Association for Social Security. New York, N. Y. April 10-11.

American Association for the Advancement of Science. Ann Arbor, Mich. June 22-25.

American Association of Industrial Physicians and Surgeons, and the American Industrial Hygiene Association—Joint Annual Convention. Gibson Hotel, Cincinnati, Ohio. April 13-17.

American Association of Orthodontists. New Orleans, La. March 16-19.

American Association of Social Workers—Delegate Conference. New Orleans, La. May.

American College of Physicians. Public Auditorium. St. Paul, Minn. April 20-24.

American Congress on Obstetrics and Gynecology—Municipal Auditorium, St. Louis, Mo. April 6-10.

American Home Economics Association. Boston, Mass. June 21-25.

American Library Association. Milwaukee, Wis. June 21-27.

American Medical Association. Convention Hall, Atlantic City, N. J. June 8-12.

American Psychiatric Association. Hotel Statler, Boston, Mass. May 18-22.

American Public Health Association—71st Annual Meeting. Headquarters, Municipal Auditorium, St. Louis, Mo. October 27-30.

American Society of Civil Engineers—Spring Meeting, New Orleans, La. April. Summer Meeting, Spokane, Wash. July.

American Society of Planning Officials—Joint Conference with National Conference on Planning. Indianapolis, Ind. May 24-28 (tentative).

American Water Works Association—Indiana Section—Purdue Memorial Building, Lafayette, Ind. April 9-10.

Canadian Section—General Brock Hotel, Niagara Falls, Ontario, Canada, April 15-17.

Southeastern Section. Savannah, Ga. April 20-22.

New York Section. Niagara Falls, N. Y. April 30-May 1.

Pacific Northwest Section—Marcus Whitman Hotel, Walla Walla, Wash. May 7-9.

Ohio Section. Toledo, Ohio. May 15-16. Annual Convention—The Stevens Hotel, Chicago, Ill. June 21-25.

Greater New York Safety Council, Inc.—Thirteenth Safety Convention and Exposition. Hotel Pennsylvania, New York, N. Y. March 3-6.

Institute of Food Technologists. Minneapolis, Minn. June 15-17.

Michigan Public Health Association. Grand Rapids, Mich. November 11-13.

Missouri Public Health Association. Kansas City, Mo. May 7-9.

National Association of County Officials. Hollywood, Calif. May 20-23.

National Association of Housing Officials. Los Angeles, Calif. June 10-13.

National Conference of Social Work. New Orleans, La. May 10-16.

National Council of State and Local Public Welfare Administrators. May.

National Education Association. Denver, Colo. June 28-July 2.

National Gastroenterological Association. Biltmore Hotel, New York, N. Y. June 3-6.

National Organization for Public Health Nursing. Biennial Convention. Palmer House, Stevens Hotel and The Coliseum, Chicago, Ill. May 18-22.

National Tuberculosis Association—38th An-

# American Journal of Public Health

## and THE NATION'S HEALTH

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### Epidemiology of Tuberculosis in a Mental Hospital\*

JOHN K. DEEGAN, M.D., J. E. CULP, M.D., AND  
F. BECK, M.D.†

*Hermann M. Biggs Memorial Hospital, Ithaca, N. Y.*

EARLY in 1938, in reviewing the tuberculosis problem in Seneca County, New York, it was noted (1) that 23 per cent of all the cases of tuberculosis on the register were or had been employed at Willard State Hospital for Mental Diseases, and (2) that during the preceding 24 months there had been diagnosed among the employees of Willard State Hospital 11 cases of active tuberculosis of the lungs. These employees had been diagnosed following the onset of respiratory symptoms and were, for the most part, far advanced cases. This high incidence of tuberculosis in an employee group of approximately 725 was considered very significant and indicative of a situation requiring investigation, particularly because many of the afflicted had applied for compensation under the Workmen's Compensation Law. The New York State Insurance Fund reports that since 1935 it has expended more than

\$900,000 for medical and nursing care and compensation for 120 cases of tuberculosis which had been declared compensable among the 17,000 employees of the Department of Mental Hygiene.

Accurate data concerning the incidence of tuberculosis in the patient population at Willard Hospital was totally lacking, although known tuberculous patients were segregated in separate buildings. However, several of the afflicted employees had never worked on any tuberculous division and this fact caused considerable speculation concerning the incidence of tuberculosis in the general hospital population. A preliminary survey of the practices followed in diagnosing tuberculosis revealed a lack of trained personnel and equipment, and it seemed probable that there were many unrecognized active tuberculosis patients, exposure to whom was in part responsible for the tuberculosis problem in the employee group. This suspected high incidence of tuberculosis in the patient population was confirmed on reviewing the patient deaths at Willard from July 1, 1927, to June 30, 1938, when it was noted

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\* Read before the Epidemiology Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 14, 1941.

† Now in the New York State Department of Health.



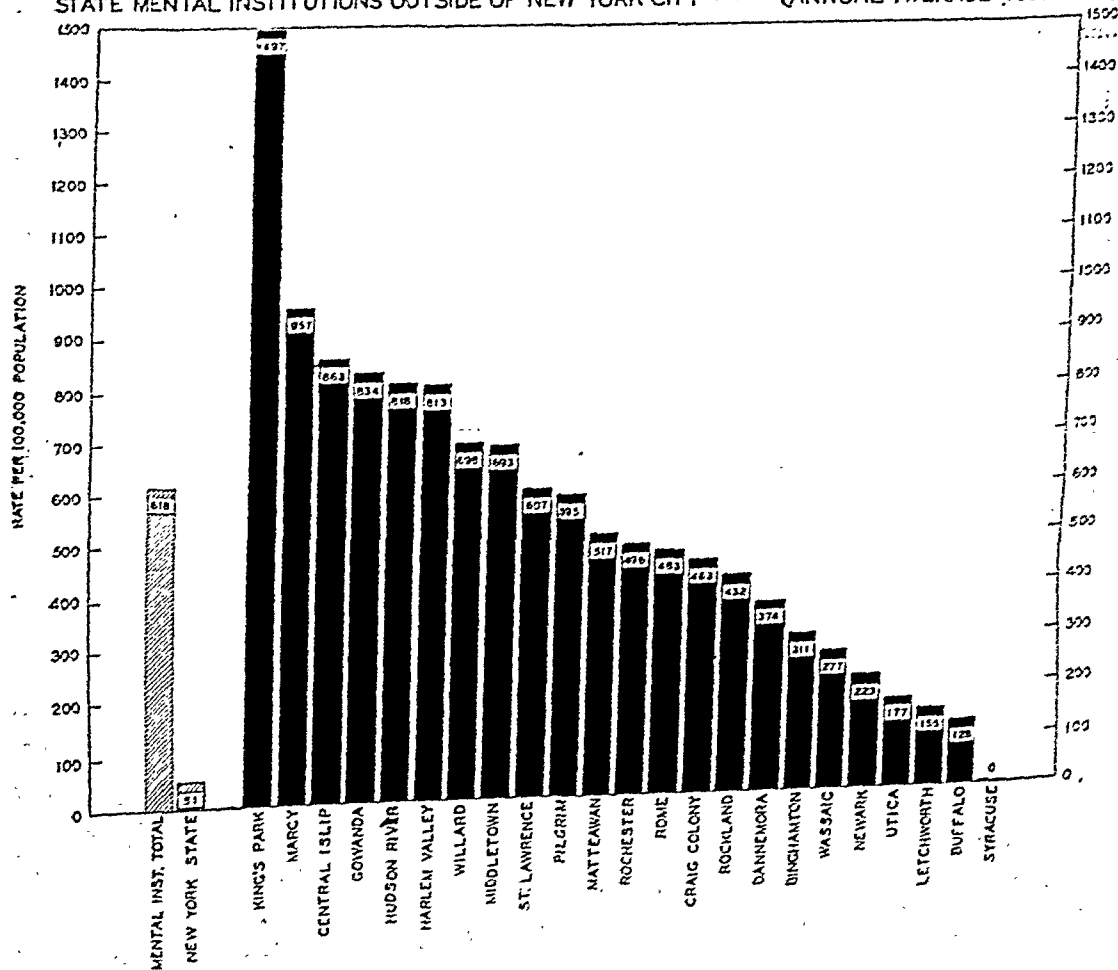
that tuberculosis was given as a cause of death in  $8\frac{1}{2}$  per cent of all patients who died (198 of 2,321 deaths). The large number of tuberculous deaths prompted the investigation of the reported death rate from tuberculosis in other New York State mental institutions outside of New York City and the findings are presented in Graph I. The rate ranged from 0 per 100,000 in the Syracuse State School for Mental Defectives which houses mainly children and young adults to 1,497 per 100,000 in Kings Park Hospital. For the 3 year period 1937-1939 the tuberculosis death rate in mental hospitals was more than 12 times that of the general population of New York State, 618 per 100,000 versus 51 per 100,000. These startlingly high tuberculosis death

rates were found to have been prevalent for years, as presented in Graph II, which shows that during the period 1915 through 1939 the death rate in mental institutions was from 10 to 12 times that reported among the general population of the state.

A review of the literature confirmed the findings that the mortality and morbidity rates from tuberculosis in institutions for the care of patients with mental diseases are markedly elevated. Various investigators<sup>1,2</sup> have commented on the overcrowding of mental patients and the carelessness of these patients in matters of personal hygiene as influencing the high incidence of tuberculosis in mental hospitals. The increase of tuberculous infection among patients according to the length of hos-

GRAPH I

DEATH RATES FROM TUBERCULOSIS (ALL FORMS) IN NEW YORK STATE AND IN STATE MENTAL INSTITUTIONS OUTSIDE OF NEW YORK CITY - - - (ANNUAL AVERAGE 1937-1939)



pitalization has also been demonstrated<sup>1, 3, 4</sup> and the inference drawn that many patients contracted tuberculosis after admission to the hospital, there being ample opportunity for cross-infection.<sup>5</sup> Several epidemiologists concluded that susceptibility to tuberculosis is not related to the type of mental disorder, except in so far as the mental disorder affects the length of time in an institution. Other reports<sup>5, 6, 7</sup> have stressed the fact that employees working among the undiscovered tuberculosis cases in mental hospitals have contracted pulmonary tuberculosis.

#### INITIAL PATIENT SURVEY

At the onset of the survey attention was directed to the problem of cost. Adequate fluoroscopic facilities were lacking, making the use of x-ray films compulsory. Therefore, it was originally planned to do a preliminary "screening" by means of tuberculin testing and to x-ray the reactors only.

All patients except those known to be tuberculous received an intradermal test of 1.0 mg. of Old Tuberculin, 3,317 patients were tested and 2,872 (86.6 per cent) reacted.

The high incidence of tuberculous infection as indicated by the tuberculin reactor rate prompted us to x-ray the chests of the entire patient population rather than the reactors only. The additional cost was justified by the fact that films of known non-reactors could be of value: (1) as a check on the tuberculin test, (2) as a means of diagnosing non-tuberculous pulmonary and heart disease, and (3) in future epidemiological investigations should these patients subsequently develop tuberculosis.

During the course of the survey 3,407 adult patients (Table 1) between ages 17 and 91 were x-rayed, 14" x 17" celluloid films being used. Patients whose x-rays showed evidence of tuberculosis were studied carefully in an attempt to evaluate their dynamic status. Such

GRAPH II

DEATH RATES FROM TUBERCULOSIS (ALL FORMS) IN NEW YORK STATE AND IN STATE MENTAL INSTITUTIONS OUTSIDE OF NEW YORK CITY - - - - - (1915 - 1939)

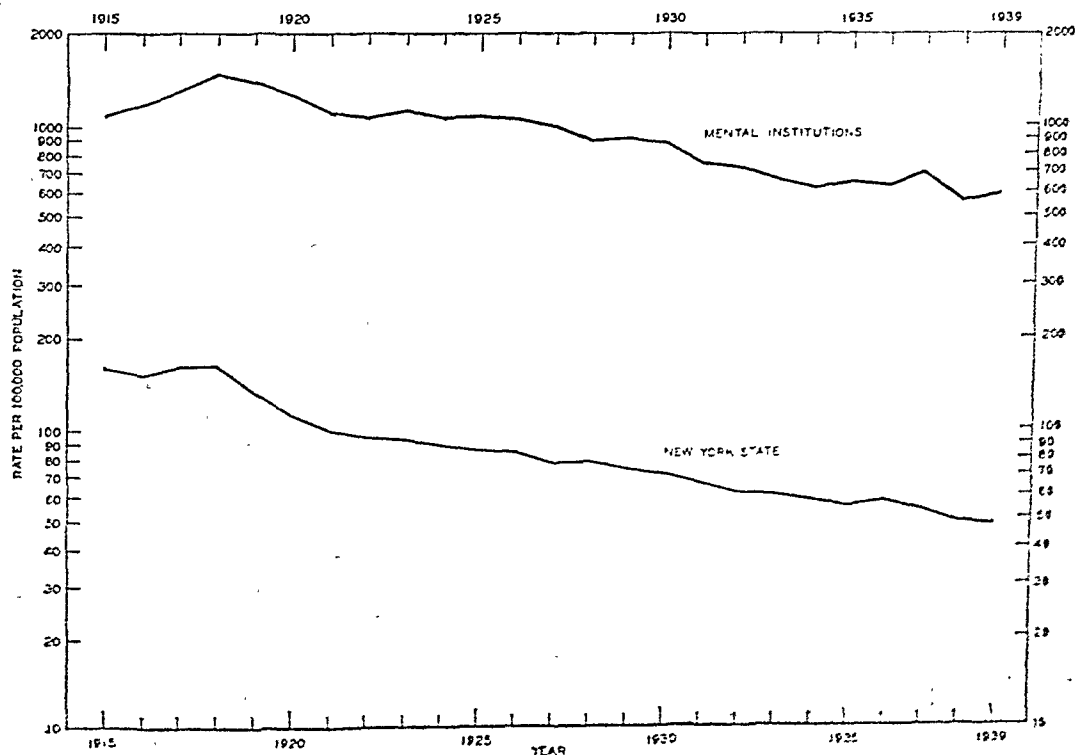


TABLE 1

*Willard State Hospital Initial Patient Survey by Age, Sex and Diagnosis*

Pulmonary Tuberculosis												
Age	Sex	Total	No Manifest Pulmonary Disease	Active			Inactive			Apparently Healed	Post-Tbc. Calcification	Undiagnosed Pul. Disease
				Minimal	Mod. Adv.	Far Adv.	Minimal	Mod. Adv.	Far Adv.			
Total	T	3,407	2,663	20	33	23	126	30	1	110	351	50
	M	1,688	1,309	11	12	10	59	15	1	75	172	24
	F	1,719	1,354	9	21	13	67	15	..	35	179	26
15-24	M	53	50	..	..	..	2	..	..	..	..	1
	F	49	48	..	..	..	..	..	..	..	1	..
25-34	M	172	158	..	..	2	1	1	..	3	7	..
	F	102	88	..	..	1	5	2	..	..	6	..
35-44	M	234	186	1	6	..	11	5	..	6	17	2
	F	229	183	3	7	1	9	3	..	7	14	2
45-54	M	388	301	4	2	2	10	3	..	15	42	9
	F	388	310	1	4	4	8	3	..	6	44	8
55-64	M	398	283	3	3	4	19	2	1	28	53	2
	F	428	330	1	4	3	25	1	..	12	45	6
65-74	M	285	210	3	..	..	12	3	..	17	33	7
	F	308	224	2	3	..	14	4	..	7	49	3
75 and over	M	158	121	..	1	2	4	1	..	6	20	3
	F	215	171	2	3	4	6	2	..	3	19	3

study included serial and stereoscopic films as indicated, and examination of the sputum when present for acid-fast bacilli. It is sometimes very difficult to get adequate sputum specimens from psychotic patients, and in many cases we were forced to judge activity by changes in serial x-rays or the presence of cavities. Our judgment of activity of the tuberculous lesions is based, in most cases, on about two years' observation.

We have classified our findings of tuberculous infection into four groups: (1) Active, (2) Inactive, (3) Apparently Healed, and (4) Calcification. In the Active group we included cases with cavities, evidence of progressive x-ray changes in serial films, positive sputum and a very few cases of exudative disease which appeared active on a single film. The Inactive group included those cases who appeared arrested or apparently arrested according to the National Tuberculosis Association Standards, while the Apparently Healed group comprises those cases of parenchymal fibrotic or fibrocalcific in-

filtration of little apparent present clinical significance. Solitary parenchymal or hilar calcified nodules or both were placed under the heading "Calcification."

Of the 3,407 patients studied we considered 76 (2.2 per cent) to have active tuberculosis; 157 (4.6 per cent) to be inactive; 110 (3.2 per cent) to be healed and an additional 351 (10.3 per cent) to show evidence of calcification. A total of 694 patients (20.3 per cent) presented x-ray evidence of infection, while 10 per cent showed evidence of reinfection type of tuberculosis, either active, inactive, or apparently healed. These totals included new admissions during the survey as well as new cases which developed during the same period. A study of 587 admissions during 1939 and 1940 revealed 17 cases of parenchymal tuberculosis (2.9 per cent), of which 7 were considered active, 2 inactive, and 8 apparently healed. In addition, calcification was noted in 52 patients (8.9 per cent).

Following the initial x-raying of all patients which was completed in the

early summer of 1939 suitable quarters in a building of modern construction were provided for the active cases. Likewise, the inactive and apparently healed cases were segregated so that they could remain under close observation. This segregation broke the contact with non-tuberculous patients and reduced the contact of employees to infectious cases to the lowest possible level.

#### SECOND PATIENT SURVEY

In 1940 x-ray films were repeated on 2,414 patients whose previous films revealed no tuberculosis, and it was found that 16 (0.66 per cent) new active cases had developed, 14 minimal, 1 moderately advanced, and 1 far advanced. It is probable that many of these cases had been in contact with open cases subsequent to their first film during the period when segregation of known active cases was in the process of development. The mental diagnosis in 13 of these 16 new cases was dementia praecox.

In the summer of 1940 there were retested 275 patients who had previously been negative to tuberculin and

again 1.0 mg. of OT was used. Of the 275 patients 130 (47.3 per cent) reacted 2 years after the first test and presumably had become infected following the first test.

In July, 1941, 163 patients who in 1940 had been tuberculin-negative were retested and 31 (19 per cent) had reactions, none of whom showed x-ray evidence of active clinical tuberculosis.

#### EMPLOYEE SURVEY

In view of the fact that 11 cases of active tuberculosis had been diagnosed in the employee group in 1936 and 1937 one of the prime objectives was to survey the employees in an attempt to discover unknown cases. Considerable effort from an educational standpoint was necessary before we received the support of the group and it was deemed practical to omit the tuberculin test and take only 14" x 17" chest films.

During the period September, 1938, to September, 1939, initial chest x-rays were made of 749 employees and staff members (Table 2). Clinical tuberculous lesions were found in 12 (1.5 per cent) individuals, 9 were minimal

TABLE 2

*Willard State Hospital Employees, September, 1938-September, 1939,  
by Age, Sex and Diagnosis*

Clinically Significant Pulmonary Tuberculosis													
			New			Previously Reported							
Age	Sex	Total	Minimal	Mod. Adv.	Far Adv.	Minimal	Mod. Adv.	Far Adv.	Post-Tbc. Calcification	Pub. Tbc. Appar- ently Healed	Pub. Tbc. Suspected	Undiagnosed Pub. Disease	No Manifest Tuberculosis
Total	T	749	8	1	1	1	..	1	74	16	2	5	642
	M	393	5	1	1	..	..	1	41	6	1	1	338
	F	356	5	..	..	1	..	..	33	10	1	2	304
15-19	M	2	..	..	..	..	..	..	..	..	..	..	2
	F	7	..	..	..	..	..	..	..	..	..	..	7
20-24	M	74	..	..	..	..	..	..	5	..	..	..	71
	F	57	2	..	..	1	..	..	4	..	..	..	50
25-34	M	133	3	..	..	..	..	..	12	2	..	..	116
	F	132	2	..	..	..	..	..	13	5	1	1	110
35-44	M	98	..	1	1	..	..	1	14	1	1	..	79
	F	86	..	..	..	..	..	..	8	2	..	..	74
45-54	M	58	..	..	..	..	..	..	8	2	..	1	47
	F	49	..	..	..	..	..	..	3	1	..	..	43
55 and over	M	28	..	..	..	..	..	..	4	1	..	..	23
	F	25	1	..	..	..	..	..	5	1	..	..	18

in extent, 1 moderately advanced and 2 far advanced. The diagnosis of apparently healed pulmonary tuberculosis was made in 16 (2.0 per cent) cases, the majority of whom presented fibrotic or fibrocalcific infiltration giving the appearance of an obsolete process. Another 74 (9.3 per cent) employees revealed evidence of calcification of the parenchyma or hilar lymph nodes or both.

During the year September, 1939, to September, 1940, all employees had a second x-ray of the chest. Three employees (2 student nurses and 1 attendant) were found to have developed minimal tuberculous lesions in contrast to normal findings in the year previous. All 3 individuals were asymptomatic at the time of their diagnosis but had been in contact with known cases of tuberculosis among the patients.

#### DISCUSSION

A consideration of the findings in the various groups is pertinent. Over 50 per cent of the patients segregated in the tuberculosis pavilions previous to the survey were found not to have tuberculosis, the criteria for diagnosis in this group having been inadequate. The occurrence of significant cases of tuberculosis among the group of new patients tends to be lower than among the resident group and, while accurate statistical data are not available, it is our impression that the number of cases found increases with the duration of hospitalization.

From a mental standpoint it was noted that the highest case yield was in the more deteriorated patients where factors of personal hygiene and the general character of the surroundings would seem of importance. In the building containing this type of female patient 52 of 310 inmates presented evidence of reinfection type of pulmonary tuberculosis, while in the corresponding male building there were 56 cases among 287

patients. Dementia praecox was the diagnosis in 52 per cent of the patient population and this particular group yielded 67 per cent of the total tuberculosis cases found. Prolonged hospitalization in a tuberculous environment of these dementia praecox patients rather than a specific lack of resistance of this type of patient to tuberculosis is thought to be the dominating epidemiologic factor.

Segregation of the known cases of tuberculosis greatly reduced the health hazard but re-x-raying the previously negative patients plus the re-testing of previously tuberculin-negative patients in 1940 and 1941 revealed a high incidence of new disease and infection. From an epidemiological standpoint these results might have been caused by exposure to open cases of tuberculosis prior to the completion of segregation or exposure to new cases developing as a result of endogenous reinfection. To evaluate the problem annual x-ray surveys of the entire hospital population are desirable.

This problem was discussed<sup>9</sup> with the authorities of the New York State Department of Mental Hygiene and New York State Department of Health, and subsequently a tuberculosis control program drawn up by those agencies<sup>10</sup> for New York State Mental Hospitals. This program encompasses (1) a survey of mental hospitals by means of 4" x 5" x-ray film to determine the extent of the tuberculosis problem, and (2) necessary steps for control. The control measures are outline as follows:

#### *Administrative:*

1. Establishment of system of records to provide clinical, epidemiological, and statistical data.
2. Establishment of necessary prophylactic procedures and institution of a tuberculosis control educational program for employees associated with inmates, particularly in the tuberculosis wards.
3. Consultation service between the staffs of the Division of Tuberculosis of the State

Department of Health and the hospitals regarding all phases of the control and treatment program.

#### Patients:

1. Segregation of all known tuberculous cases and treatment thereof.
2. New patients to have chest x-ray alone or chest x-ray of reactors to tuberculin test.
3. X-ray reëxamination at end of one year to determine future needs.

#### Employees:

1. Study of employees with tuberculous lesions to determine clinical status.
2. Preëmployment x-ray examination of all new employees.
3. X-ray examination every 6 months of employees giving direct service to inmates and every 3 months of employees in tuberculosis wards.

As a result of an appropriation of \$45,000 by the Legislature of the State of New York, this program was recently inaugurated.

#### SUMMARY

Of the 3,407 patients studied initially, 343 showed evidence of reinfection type of tuberculosis, 76 of whom were clinically active; an additional 351 patients showed x-ray evidence of calcification either in the pulmonary parenchyma, the hilar glands, or both.

Re-x-ray within one year of 2,414 patients whose initial films were negative revealed development of active tuberculosis in 16 instances.

Segregation of known cases of clinical tuberculosis did not completely eradicate the infection hazard since 19 per cent of the negative reactors in the general population in 1940 became posi-

tive reactors within the year following such segregation.

Periodic x-raying of the chest of psychotic patients is of definite value in the early recognition of cases of tuberculosis and the control of this problem.

Of the 749 employees studied initially, 28 showed evidence of reinfection type of tuberculosis, 12 of whom were clinically significant; an additional 74 employees showed x-ray evidence of calcification either in the pulmonary parenchyma, the hilar glands, or both. Re-x-ray within one year of employees whose initial films were negative revealed development of active tuberculosis in 3 additional instances.

Routine x-raying of the chests of employees in contact with tuberculous patients is definitely indicated.

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# Study of Atypical Enteric Organisms of the *Shigella* Group\*

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THE identification of the incitants of enteric disease presents slight difficulty when the microorganisms in question yield the biochemical and serological reactions that have become established for the various species. However, the problem of classification is not an easy one if the reactions of an isolated strain do not conform to the criteria that in the experience of different observers have been found to be definitely fixed for a given species. Scientific accuracy therefore imposes upon the conscientious bacteriologist the need for careful study of those microorganisms which do not completely fulfil accepted requirements for a precise classification.

Some recent experiences in the diagnostic laboratory of the Detroit Department of Health prompted the preparation of this report in order to discuss a number of strains which are seemingly identical and apparently belong to the *Shigella* group but which do not fulfil the biochemical and serological requirements for classification into any of the currently accepted groups of enteric pathogens. These strains were isolated from fecal specimens examined during the period from February, 1939, to August, 1941. The isolations were made from 116 specimens obtained from 83 individuals. Included in the group of persons who submitted these specimens

were patients with suspected or proven enteric disease, contacts, and food handlers whose clinical history revealed suggestive or definite reference to a previous intestinal disease.

The routine procedure employed in the examination of all fecal specimens is as follows: Two plates of MacConkey's are streaked in succession directly from the fecal mass using the same loopful of inoculum in order that the second plate may be less heavily seeded. One plate of SS agar is also streaked directly. Two bismuth sulfite agar poured plates are prepared, using as the inoculum 1 ml. and 5 ml. portions, respectively, of a 5 per cent emulsion of the specimen in physiological salt solution. In addition, approximately 1 gm. of feces is emulsified in one tube of tetrathionate broth. After incubation at 37° C. for 18-24 hours, transfers from this latter medium are made by streaking single plates of MacConkey's agar, SS agar, and bismuth sulfite agar. After incubation of all plates suspicious colonies are picked for transplant to Krumweide's triple sugar agar slants. The cultures on this medium which show acid reaction but no gas in the butt and no change on the slant surface are transferred to tryptone broth and, after 18 hours' incubation, tests made for motility as well as for indol production. At the same time transfers are made to tubes of broth containing the single sugars—dextrose, lactose, mannite, xylose, and dulcitol. Finally specific agglutinating sera are employed as indicated by these

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reactions. Difco dehydrated media were used throughout.

The organisms which are discussed in this report have the following cultural characteristics. They are Gram-negative bacilli, morphologically similar to those of the Eberthella-Shigella group. They are non-motile when freshly isolated although they may become motile on repeated subculture. Growth on phenolized agar, however, results in the reversion to smooth colonies with loss of motility. Colonies appearing on MacConkey's agar or on SS agar are colorless and transparent; while those on bismuth sulfite are green. Cultures on Krumweide's triple sugar agar slants produce acid but no gas in the butt and no change on the slant surface. Acid but not gas is produced when these strains are grown in media that contain only dextrose or mannite. No acid or gas is produced when media containing lactose, maltose, xylose, dulcitol, salacin, dextrin, or saccharose are employed. The production of indol is readily demonstrated in tryptone broth cultures. Utilization of citrate is demonstrated on slants of Simmon's citrate agar. Gelatin is not liquefied nor is litmus milk changed after 10 days' incubation. Growth on nitrate agar is accompanied by the reduction of nitrates to nitrites. Cultures grown on Kligler's iron agar or on agar containing lead acetate show no production of hydrogen sulfide. In plain broth cultures there is no evidence of pellicle formation except when the strain is in the rough phase. From analysis of these reactions, it appears that the utilization of citrate and possible development of flagella in the rough stage are the only cultural characteristics in which these organisms differ from those of the *Shigella paradysenteriae* Flexner group.

However, serological reactions show that this similarity is not as great as the biochemical reactions indicate. Antigenically, no resemblance to any of the

well known types of the enteric pathogens could be shown. None of the 116 strains were agglutinated by antisera prepared against *Shigella dysenteriae* Shiga, *Shigella paradysenteriae* Flexner V, W, X, Y, or Z, *Shigella sonnei*, *Shigella sp.* (Newcastle type), *Eberthella typhosa*, *Proteus morganii*, *Salmonella schottmuelleri*, *Salmonella paratyphi*, *Salmonella enteritidis* or *Salmonella cholerae suis*.

A strain which was isolated from an acute case of dysentery was arbitrarily selected as the type strain. Until the present it has been identified by the serial number of the specimen from which it was isolated, namely 1544. Using this strain as antigen, an antiserum was prepared. Organisms isolated from other sources, which were compatible biochemically were agglutinated by this serum to a titer of 1:160 or higher. On the other hand, this serum did not agglutinate antigens of *Shigella dysenteriae* Shiga, *Shigella paradysenteriae* Flexner V, W, X, Y, or Z, *Shigella sonnei*, *Shigella sp.* (Newcastle type), *Eberthella typhosa*, *Proteus morganii*, *Salmonella schottmuelleri*, *Salmonella paratyphi*, *Salmonella enteritidis* or *Salmonella cholerae suis*.

Sera were also obtained from four patients while they were acutely ill with dysentery. Examination of fecal specimens obtained from these patients revealed organisms that were biochemically and serologically similar to type strain 1544, but no other organisms of known pathogenicity were found. The sera from these four cases agglutinated the organisms which were isolated from their feces as well as the original type strain 1544 to a titer of 1:160 or higher. No positive agglutination could be obtained when these human sera were tested with the other antigens listed above. These serological experiments indicate that there is an antigenic similarity between the strains which are designated as group 1544, but that they



bear no antigenic relationship to any of the other established groups of enteric pathogens.

In order to ascertain whether the cultures under observation were stable or merely in a transitory phase, the following two procedures were employed. Twenty-four strains were transplanted daily, using tryptone broth and tryptone agar slants alternately. Once a week these cultures were transferred to plates of MacConkey's agar by streaking, and single smooth colonies were selected for a repetition of the alternate transfers to tryptone broth and tryptone agar. At the end of 4 months no antigenic or biochemical alterations were observed.

In further studies, three of the strains were injected intraperitoneally into mice. Eighteen hours after injection, cultures from the blood and peritoneal fluid of each mouse were made with successful recovery of the identical strains. Passage through a second series of mice and recovery of the organisms was made in the same manner. Studies of the bacilli isolated from the second series of mice revealed no variation in antigenic or biochemical characteristics.

#### COMMENT

The intent of this report is to present our findings in which there is demonstrated the apparent possibility of an atypical strain of shigella-like microorganisms occurring with marked fre-

quency in a community, and inviting a discussion on the significance of these findings. The isolation of similar organisms from 116 fecal specimens obtained from cases of dysentery, contacts, and food handlers occurred with such frequency as to draw attention to their possible importance as specific incitants of enteric disease. Biochemically these organisms resemble *Shigella paradysenteriae* Flexner. Antigenically they are distinct and apparently belong to a homologous group but are not related to any of the well recognized types of *Shigella*.

From the viewpoint of the bacteriologist one may ask how much effort should be expended in the study of strains which do not fulfil the requirements for classification into the established types. Moreover, should they be reported as newly identified subspecies or should this observed difference be disregarded? From the standpoint of the public health administrator, the question arises regarding the advisability of having the bacteriologist report such atypical strains to the physician. Finally, is the recording of the isolation of unclassified strains of epidemiological value?

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# The Time Factor in the Chlorine and Chloramine Disinfection of Contaminated Swimming Pool Water\*

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THERE have been comparatively few extended investigations of the several conditions which to some degree must affect our practices of swimming pool sanitation. There are two outstanding reasons why swimming pools have not received greater attention. First, there has been a lack of epidemiological evidence that the intimate contact of swimmers in an enclosed body of water constitutes a good opportunity for the communication of disease. Second, the technics of the treatment and examination of drinking water have been applied to pool water. It was with particular interest in the latter reason that an investigation of swimming pool sanitation was undertaken.

In meeting the demand for a treated water for pools the sanitary engineer drew upon his experience in treating drinking water. This was a reasonable approach, and in the main must be correct since there have been no reported epidemics in pools operated in accordance with the A.P.H.A. Joint Committee Standards, though the use of pools has greatly increased in recent years. Nevertheless, there is reason to believe that the wholesale carry-over from one to another does not make the same satisfactory results a foregone conclusion. A basic difference in the disinfection

problem of pool water from that of drinking water is that contamination is continuous with its use. Therefore the disinfection must also be continuous. This continuity of disinfection is sought by maintaining a residual of chlorine, the most commonly used swimming pool disinfectant, in the pool. Since the purpose of this chlorine residual is to minimize the hazard of pathogenic bacteria being passed from swimmer to swimmer, its disinfecting action should be as rapid as possible. The length of time it takes a disinfectant to kill bacteria is a function of its concentration. Since chlorine is irritating to human beings, there is an upper limit to the concentration which may be kept in the pool. In drinking water treatment, the bounds of time and concentration are not as narrow as they are in pool water.

In attempting to provide for a continuous disinfection more attention has been given to the problem of concentration than to the time of killing. The routine test for the concentration of chlorine in water is the rapid, simple orthotolidine method. This is a valuable tool in pool water control, but it has led to two results of doubtful character. It has tended to minimize the need for bacteriological examination and in so doing it has impeded the search for better methods of bacterial tests. Second, it has brought into vogue the use of ammonia in treating pool water. At the pH of swimming pool waters and

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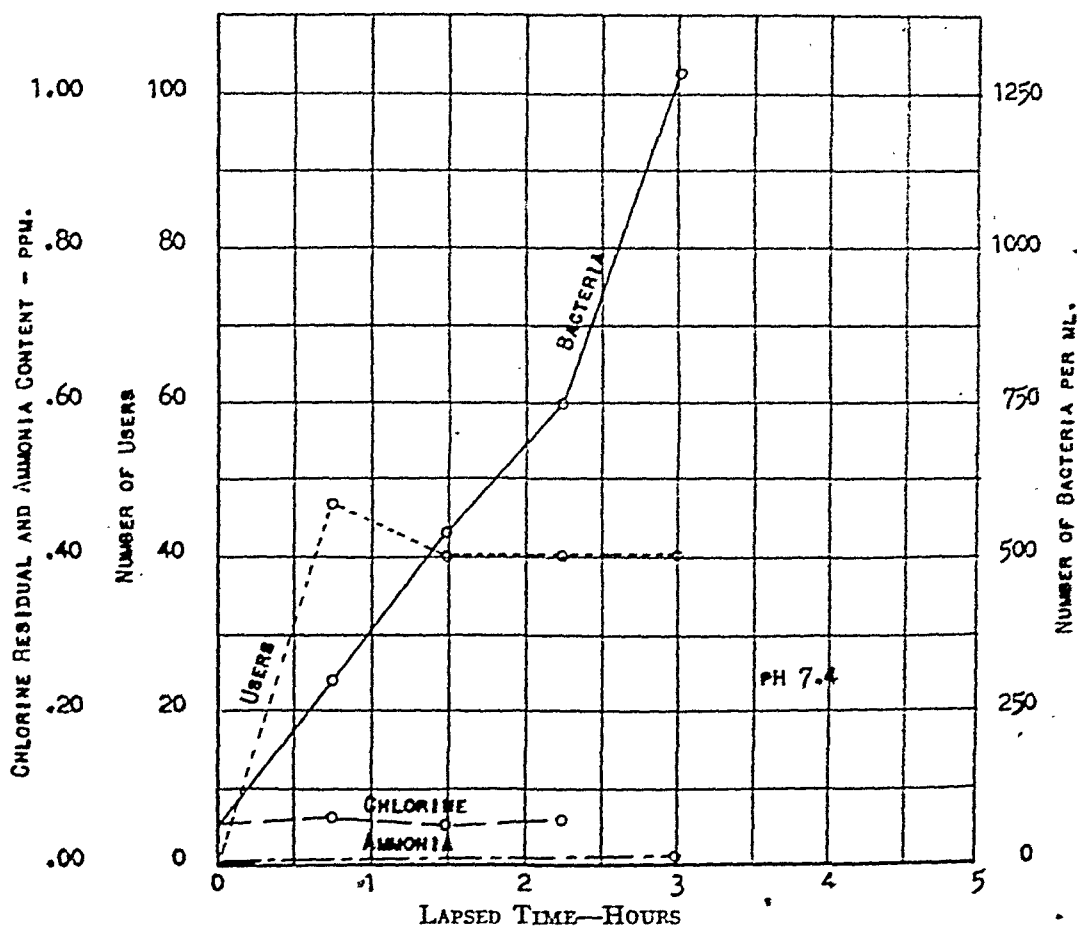


Figure 1—The Relations Between Bacterial Counts and a Constant Swimmer Load. Chlorine Residuals Below Effective Concentrations.

in the usual ratio of dosages, the ammonia and chlorine combine to form about equal amounts of monochloramine and dichloramine. The presence of chloramines in a pool makes possible the maintenance of higher chlorine residuals, as indicated by the orthotolidine test, without causing irritation to the swimmers. The orthotolidine reacts with the chlorine which is in combination with the ammonia as well as that which exists as hypochlorous acid. Yet it is solely the hypochlorous acid which is the rapid disinfecting agent. That means that the chlorine available for immediate concurrent disinfection is less than the orthotolidine test reading when chloramine is present.

In treating drinking water there are instances of conditions which make chloramine a highly desirable means of disinfection, but its carry-over into pool

water is questioned. On the face of the matter it appears to be fraught with the danger of yielding misleading readings of chlorine residual and of extending the time of disinfection. One of the objectives of this investigation was to determine whether the use of ammonia in swimming pools is a desirable procedure from the standpoint of efficient disinfection.

#### PUBLIC OUTDOOR POOL STUDIES

Making observations in two public outdoor pools in Durham, N. C., the relations among swimmer load, bacterial count, chlorine residual, and ammonia content were studied. The facilities and practices at these pools permitted the isolation of each factor and a step by step addition of each. The element of filtration did not enter as there was no filtration equipment. Figures 1, 2, 3,

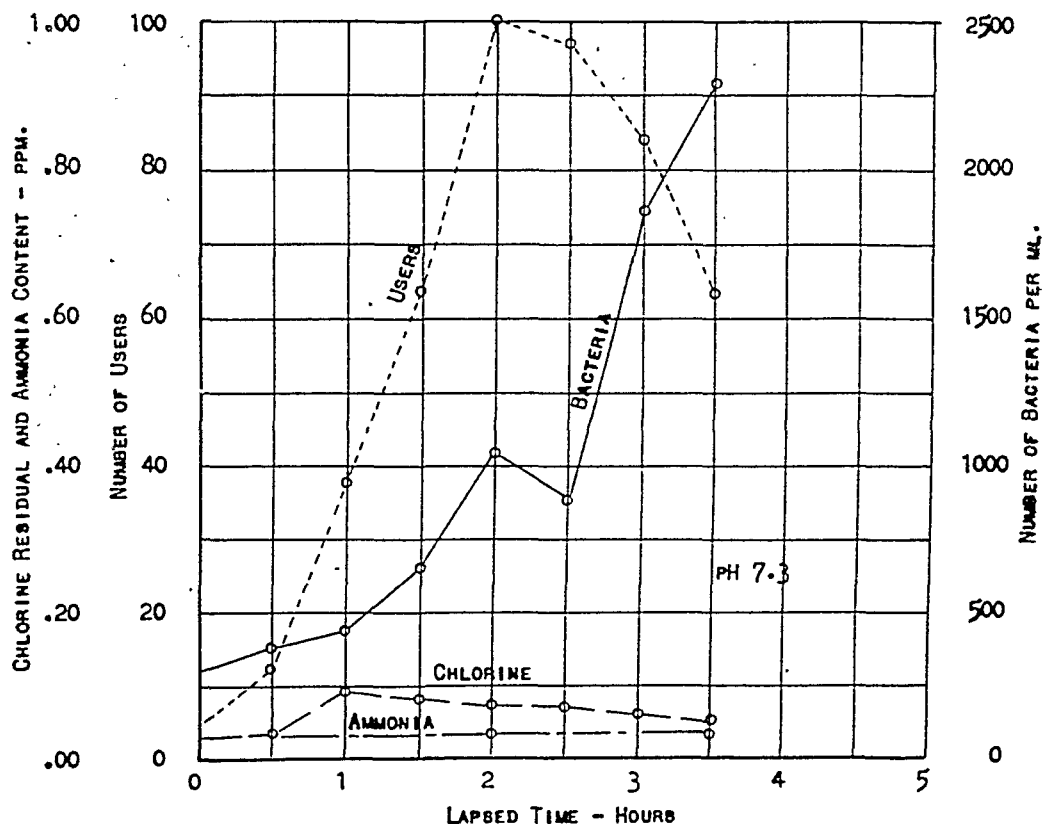


Figure 2—The Relation Between Bacterial Counts and a Normally Varying Swimmer Load. Chlorine Residuals Below Effective Concentration.

and 4 present the noteworthy data. Each figure represents a series of samples taken through a morning or afternoon swimming period. Laboratory procedures were in accordance with accepted methods, closely adhering to Standard Methods. An outstanding difference was the incubation of bacterial plates, which were inoculated at the pool, for 36 hours rather than 24 hours.

Figures 1 and 2 show the resulting bacterial counts in a pool filled freshly with city water when the only factor was the swimmer load. No chlorine or ammonia was added at the pool. In the Figure 1 series the swimmer load was constant. A rapid and nearly constant increase in bacterial count was observed throughout the swimming period, the count having increased from 59 per ml. in the unused water to 1,280 per ml. at the end of 3 hours of use by a group of 40 children. Figure 2 shows the

bacterial variation due to a normally varying swimmer load. Excepting one observation a somewhat similar increase occurred. The count rose from 298 at the start of the afternoon period to 2,350 per ml.  $3\frac{1}{2}$  hours thereafter, with a peak load of 100 children at the 2 hour point.

Figure 3 shows the effect of a single dose of chlorine in the form of calcium hypochlorite upon the bacterial counts resulting from a normally varying swimmer load. The chlorine dose, made just before the first swimmers entered the pool, was sufficient to produce a residual of 0.45 p.p.m. 30 minutes thereafter and to maintain it at that level or higher during the next 30 minutes. The chlorine produced an immediate decrease in count, and as long as sufficient residual remained, it prevented the count from increasing. When the residual had dissipated, the bacterial counts mounted in

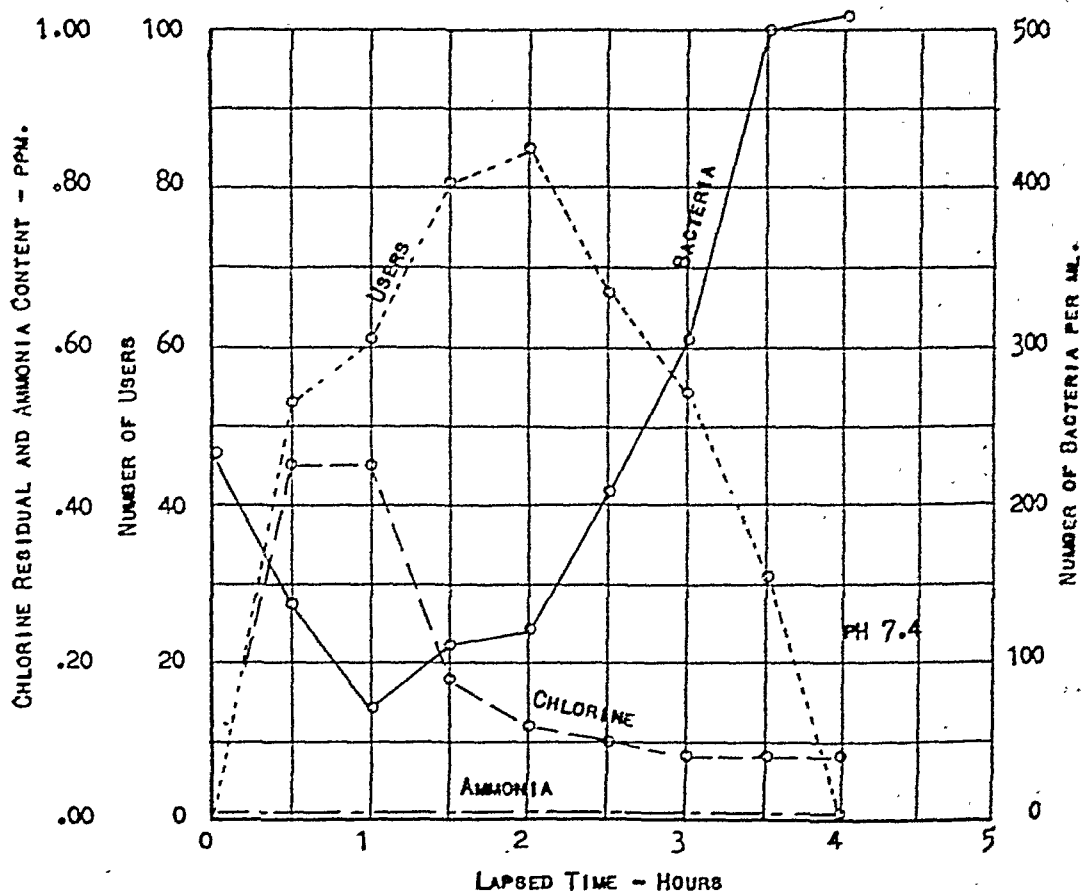


Figure 3—The Relations Among Bacterial Counts, a Normally Varying Swimming Load and a Decreasing Chlorine Residual. Five Pounds of Calcium Hypochlorite Added Immediately after First Sample.

much the same way as those shown in Figure 2.

Figure 4 shows the bacterial counts during a normally varying swimmer load of rather small numbers when chlorine and ammonia had been added to the water by means of solution feeders. Addition was stopped at the start of the swimming period when the chloramine as chlorine residual was 0.35 p.p.m. The conditions of pH and ammonia to chlorine ratio were believed to be favorable to chloramine formation. The bacterial count rose immediately with the swimmer load in much the same way as in Figure 2, when no disinfectant was in the water and the swimmer load normally varying. The increase continued to a peak beyond the peak of the swimmer load. There then occurred a break downward in the bacterial count. This is suggestive of a delayed disinfection.

The character of this bacterial curve at the start of the swimming period as compared to that of Figure 3, when straight chlorine was available and the swimmer load normally varying, indicates a lessened concurrent disinfecting power in ammoniated swimming pool water as compared to unammoniated chlorinated water.

#### EXPERIMENTAL TANK STUDIES

The desire to observe the action of chloramines over a wide range of concentrations on the bacterial flora from swimmers' bodies, and to obtain some quantitative data on the suspected delay in disinfection led to the use of an experimental tank. The fact of inferior chlorine disinfection in ammoniated pools could be established by evidence that after use under a uniform swimming load for an equal period of time

a greater number of bacteria accumulate when ammonia is used than when it is not. These results are therefore based upon the proposition that a person following uniform hygienic habits could produce a reasonably constant bacterial loading in an experimental tank used for equal periods of time. The effectiveness of disinfectants in ridding the tank water of the contaminating bacteria can then be demonstrated by noting how the accumulation and subsequent disappearance curve differs from that obtained in the absence of any disinfectant.

It was found that a tank of 425 gallons of water was satisfactory for handling one swimmer. The desired conditions of chemical dosage would be set. The swimmer of uniform hygienic habits would then use the tank for a 5 minute period. Samples were taken

before entry, during use, and after use at frequent intervals. Standard procedures of analysis were adhered to closely.

The runs at chlorine residuals below 0.20 p.p.m. were made in order to observe the bacterial accumulation in the absence of chlorine or at concentrations believed to be below the disinfecting threshold of chlorine. In the absence of ammonia addition, the residuals were kept below 0.60 p.p.m. as it is the upper limit prescribed by the Joint Committee.<sup>6</sup> Similarly, aside from one run made for comparative purposes, the residuals maintained when ammonia was added were between 0.7 p.p.m. and 1.0 p.p.m. This range is recommended by the Joint Committee in instances where ammoniation is practised. It was intended that the conditions of chlorine residual, ammonia content, pH, and

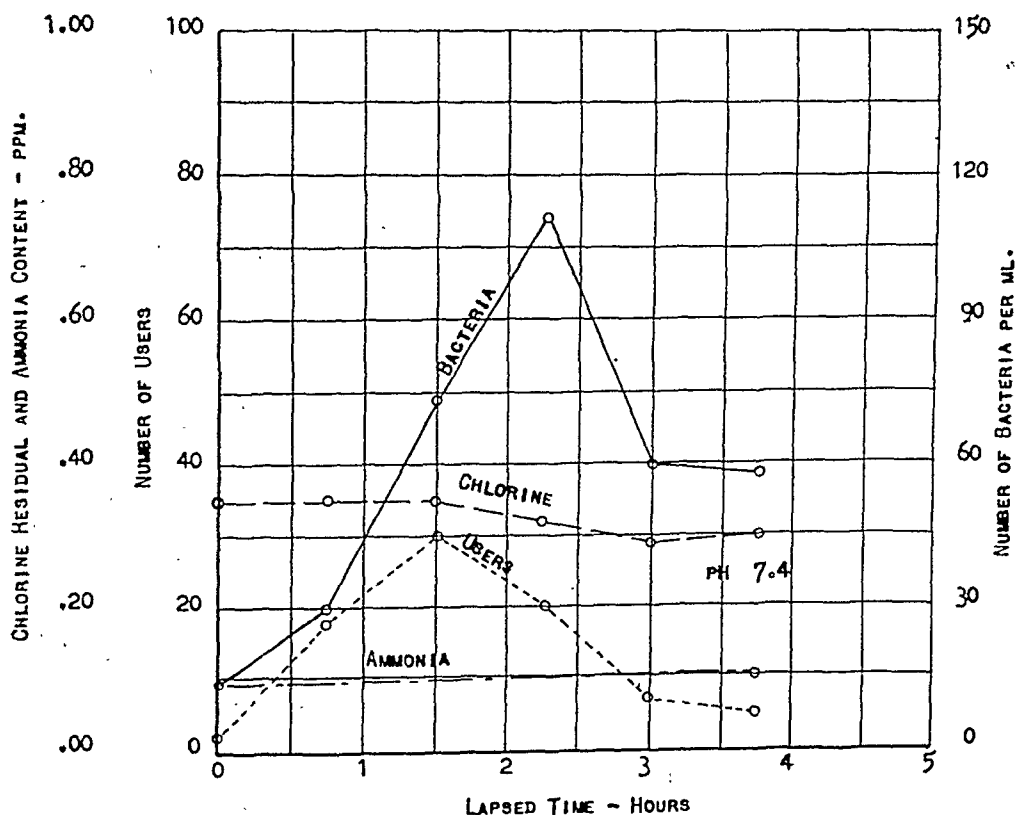
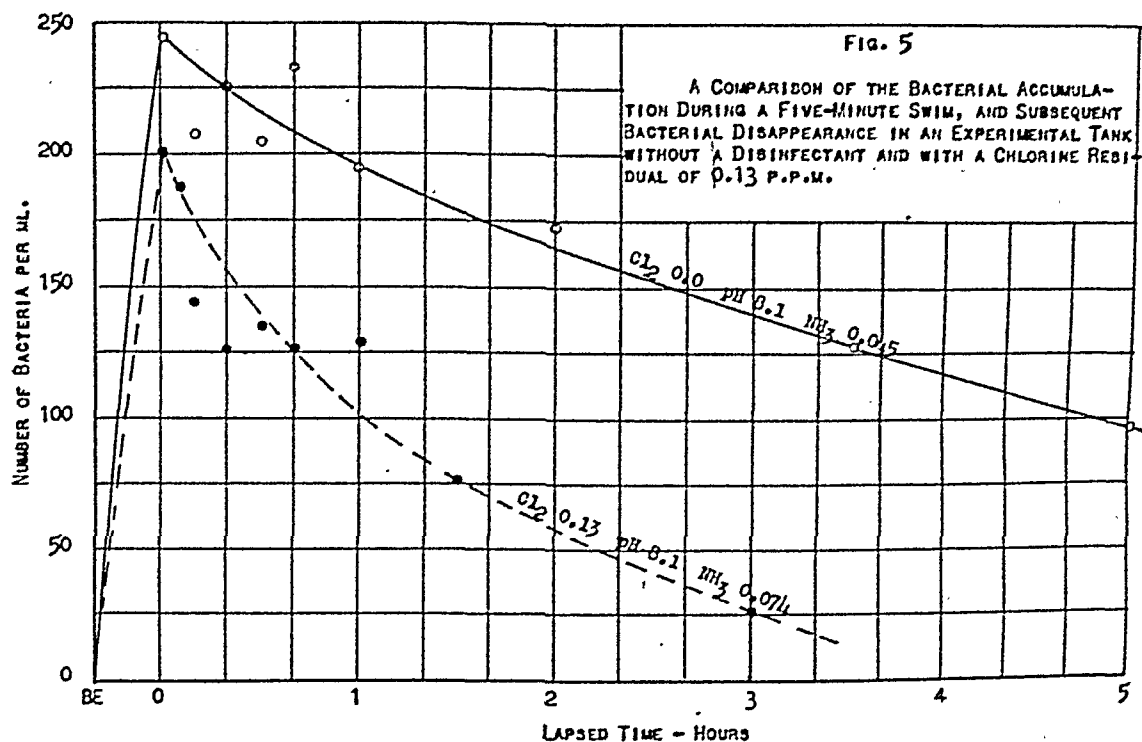


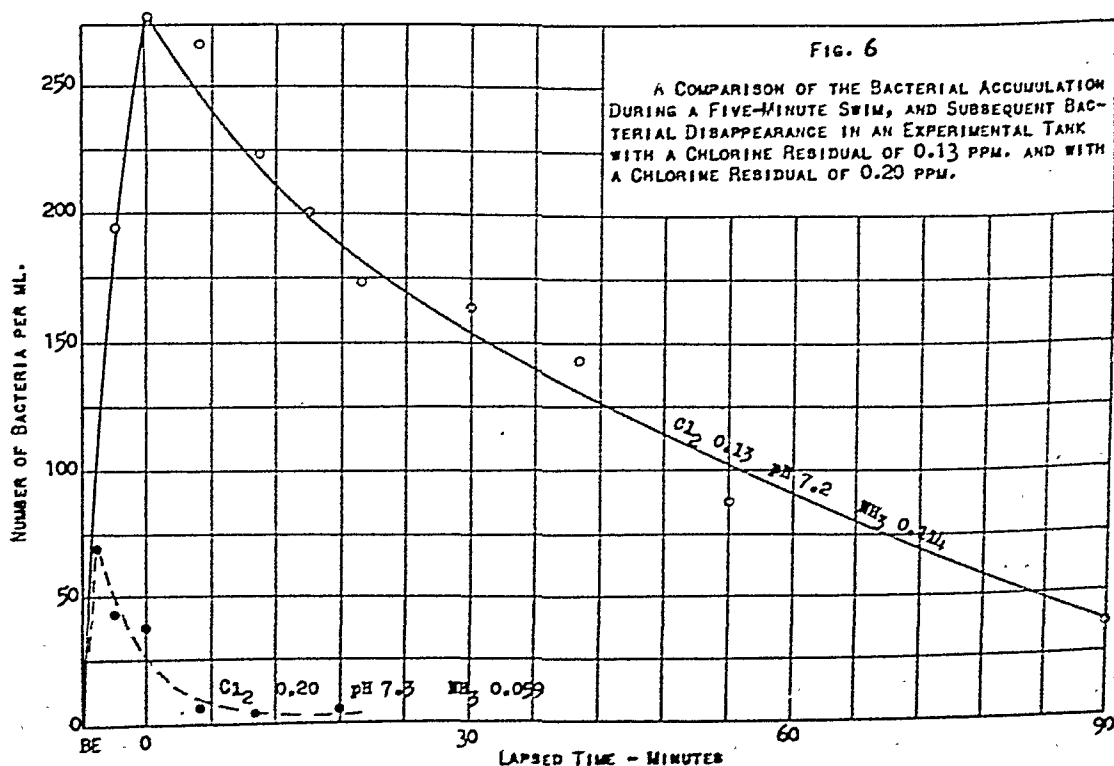
Figure 4—The Relations among Bacterial Counts, a Normally Varying Swimmer Load, a Variable Chlorine Residual and Increasing Ammonia Content. Chemicals Added by Solution Feeders and Recirculating Pump.

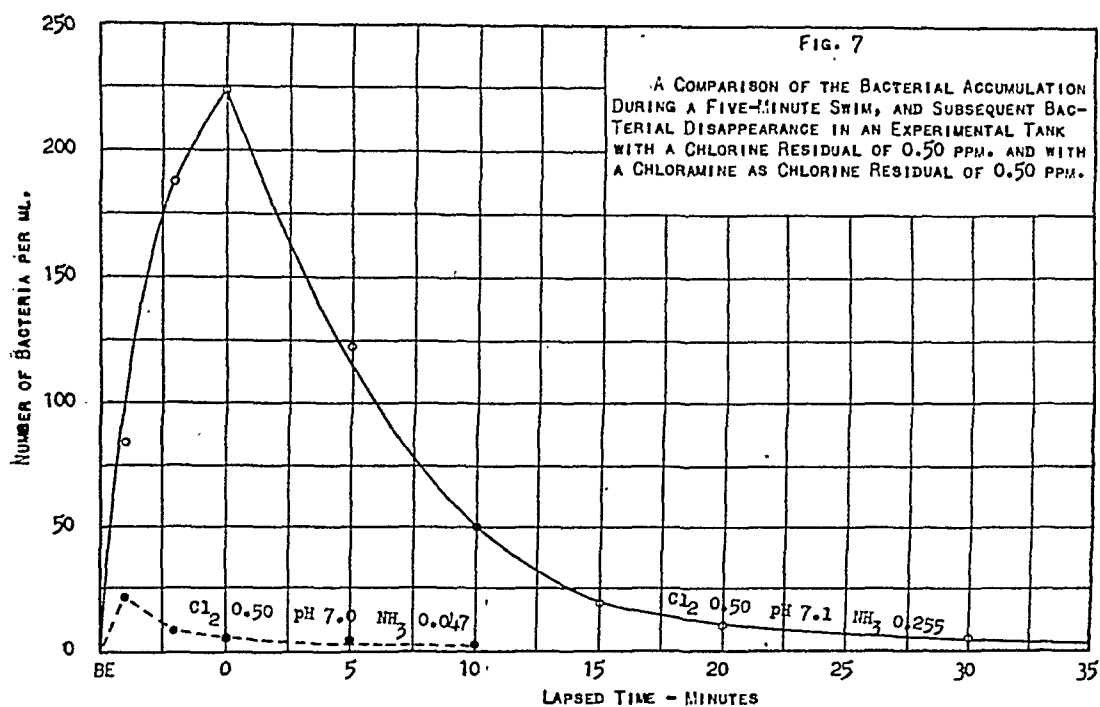


water temperature be as close as possible to those believed satisfactory, in order that the information obtained from the experimental tank could be readily related to conditions existing in pools.

Figures 5, 6, 7, and 8 present the

salient runs so arranged as to make comparisons clear. Figure 5 shows the plots of the 24 hour bacterial counts with a chlorine residual of zero compared to a residual of 0.13 p.p.m. The pH was 8.1 in each case. The ammonia content was 0.045 and 0.074 p.p.m. respectively.





The logarithmic character of the curve is evident. Both show slow decreases in bacterial counts. The small amount of chlorine had some effect as the counts decrease more rapidly in that case. At zero residual the count decreased from 245 to 140 per ml., a 43 per cent reduction, in 3 hours. At 0.13 p.p.m. residual the count decreased from 201 to 27 per ml., 87.5 per cent reduction, in the same time. Ammonia present was due to natural occurrence in water and to contribution by the swimmer.

Figure 6 shows the difference in bacterial accumulation and subsequent disappearance at a chlorine residual of 0.13 p.p.m. (ammonia 0.114), and a residual of 0.20 p.p.m. (ammonia 0.059). Under similar conditions of loading the count after 5 minutes of use reached 277 per ml. in the instance of the 0.13 residual compared to 37 per ml. in the case of a residual of 0.20 p.p.m. At the latter residual the count dropped to 4 per ml. within 10 minutes. At the 0.13 residual the count at 10 minutes was 224 per ml. At 1.5 hours it was 39 per ml. The magnitude of the areas under

the two curves is a measure of the efficiency of the two concentrations of chlorine in controlling the bacterial content of the water during the uniform swimmer loads and in the time immediately thereafter. A great increase in bactericidal velocity is noted in passing from a residual of 0.13 p.p.m. to one of 0.20 p.p.m.

Figure 7 shows the effect of the addition of ammonia. Both runs were made with a residual of chlorine of 0.50 p.p.m., and with similar conditions of loading. In one instance, no ammonia was added, in which case the incidental ammonia content was 0.073 p.p.m. at the start of the run, and 0.047 p.p.m. at the end. In the second instance, ammonia was added to produce a content of 0.255 p.p.m. In the case of no ammonia addition the count after 5 minutes of use was 6 per ml. Higher counts had existed after 1 and 3 minutes of use as is shown by the curve. With 0.255 p.p.m. of ammonia present the count after 5 minutes of use was 224 per ml. Five minutes after the swimmer left the water the count had dropped to 123 per ml. At 30 minutes

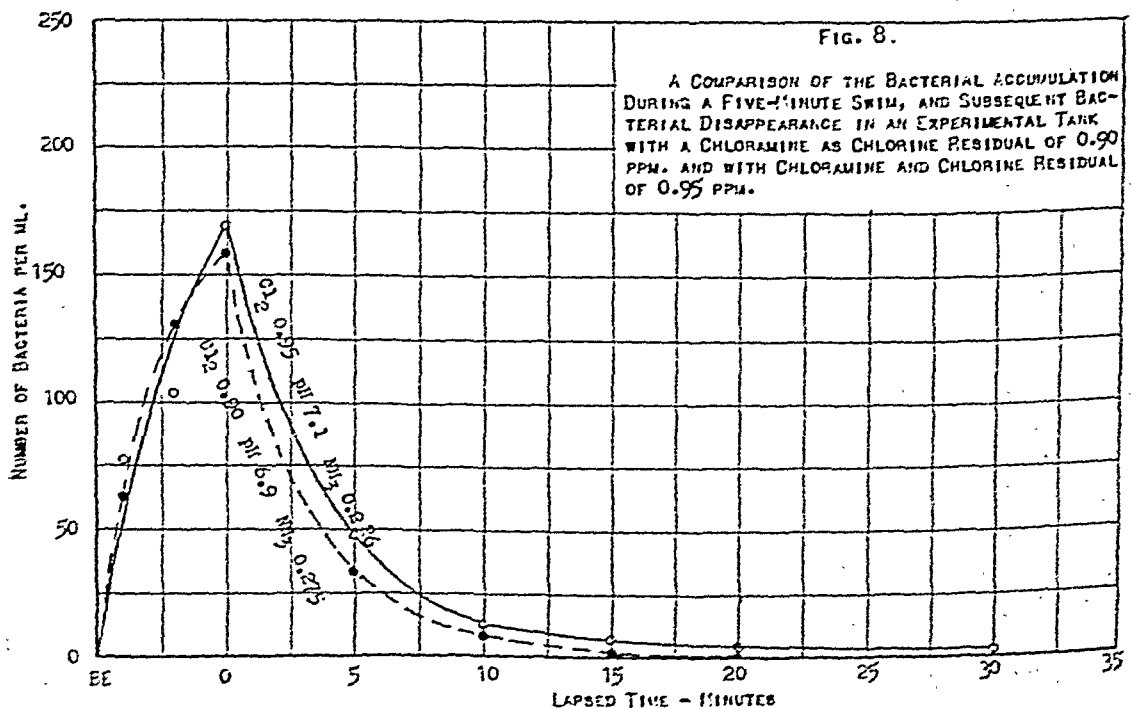


after exit the count in the tank of ammoniated water was 6 per ml., the same as the count after 5 minutes of use in the tank water to which no ammonia had been added.

The relative areas under the two curves indicate the relative effectiveness of the chlorine dosage and the chlorine-ammonia dosage. These areas may be expressed in units of bacterial minutes. That is, a weight in accordance with time of survival is assigned to each bacteria counted. The value of the ordinate multiplied by the value of the abscissa represents the area of a strip, which is in terms of bacterial minutes. By means of a planimeter the area under the curves was measured. In bacterial minute units, these are 72 in absence of ammonia, and 2,470 during ammonia dosage when the chlorine residual was 0.50 p.p.m., and a similar swimmer load was placed on the tank in both runs. This difference in bacterial minute units may be considered a measure of the exposure of fellow swimmers to the contaminating organisms washed and discharged from the body of one swimmer. Had a fellow swimmer been in the tank with the subject and remained in for a

period of 40 minutes, he would have been exposed to 2,470 bacterial minutes when the ammonia was added as against 72 bacterial minutes when no ammonia was added.

Figure 8 shows the results of two runs in which sufficient chlorine was added to ammoniated water to produce residuals of 0.90 p.p.m. and 0.95 p.p.m. In one run the ammonia was 0.275 p.p.m., a ratio of ammonia to chlorine of 1 to 3.3, and the pH was 6.9. In a second run ammonia was 0.226 p.p.m., a ratio of 1 to 4.2, and the pH was 7.1. The ratios of dosage and pH conditions are those commonly suggested for successful chloramine formation. The chlorine residuals are in the range recommended by the Joint Committee. The plots of the data show curves of a similar pattern which is decidedly logarithmic. The bacterial accumulation and subsequent disappearance are approximately the same. In the 5 minute swim period 159 bacteria per ml. accumulated at the 0.95 p.p.m. residual as compared to 170 per ml. at 0.90 p.p.m. In the 20 minutes following the swimmer's exit the count at 0.95 p.p.m. dropped to zero; at 0.90 p.p.m. to 3 per ml. In



terms of bacterial minutes, the area under the 0.95 p.p.m. curve represents 1,306 units, and the area under the 0.90 p.p.m. curve 1,200 units.

#### DISCUSSION OF RESULTS

In respect to the observations in the outdoor public pools the matter of the air being a source of bacteria must be considered. It was not possible to make a strict control run. However, data were obtained in a morning during which very few swimmers used the pool to which no disinfectant had been added. These indicated that the air was not an important source of bacterial contaminants. The studies under actual pool conditions gave evidence of a high correlation between swimmer load and bacterial counts, of a chlorine disinfecting threshold somewhere between 0.15 and 0.25 p.p.m. residual, and of a delayed disinfectant action when ammonia was added along with chlorine.

All of the data obtained from the experimental tank are dependent upon the reasonably constant bacterial loading in a uniform swim by the swimmer of controlled hygienic habits. Control runs were made before the series of disinfectant concentrations were begun. These indicated that a consistency of a remarkably high order could be expected. A difficulty that could not be circumvented was the natural occurrence of ammonia in the available water supply and the contribution of ammonia by the swimmer.

These uncontrollable sources of ammonia and the lack of a satisfactory specific test for chloramines cast some doubt on the distinction that must be made as to whether the disinfectant action in runs of low chlorine residual was straight chlorine or chloramine. Analysis by ratios is not satisfactory at the low concentrations of 0.13 and 0.20 p.p.m. of residual chlorine. Our knowledge of the chlorine, ammonia, and chloramine equilibrium at small concen-

trations is scant and our technics of analysis poor.<sup>1</sup> Decision on these must be withheld until our understanding is more complete.

In dealing with the higher residuals of chlorine and with the instances of ammonia addition there is no doubt that chloramines were formed. Figure 7 showing two runs where the sole difference was the addition of ammonia is offered as clear-cut evidence that there is a loss in concurrent disinfecting power in ammoniated water. At the higher chlorine residuals in the range recommended by the Joint Committee for use with ammonia, this loss and the consequent extension of the disinfecting time are demonstrated by the data from the experimental tank. A period of 15 to 20 minutes of contact was required to effect bacterial reductions of 98 per cent or better.

Though little data have been presented here on the ammonia contribution by swimmers, it is closely related to the problem under discussion. Data from these studies and other data obtained with the purpose of examining the significance of it in a recirculating pool indicate that swimmer contribution may reach amounts sufficient to produce unwittingly the conditions favorable to chloramine formation, but that the concentration of chlorine in the recirculating line at the point of dosage is great enough to impose by oxidation a ceiling upon the total ammonia content. A condition analogous to that studied by Weber and associates<sup>13</sup> in demonstrating that the relation of ammonia to chlorine is a specialized case of breakpoint chlorination. It opens to speculation the possibility of utilizing some form of flash reading of chlorine residuals in swimming pools as suggested by Laux<sup>7</sup> for controlling breakpoint chlorination of a public water supply.

Time does not permit an adequate review of the literature which while not extensive does afford corroboration and

contradiction on the points that have been made. Muzzey<sup>9</sup> and Pringle<sup>10</sup> agreed as to the direct correlation of load and bacterial count whereas Davis,<sup>2</sup> and Pearce and Sutherland (Davis<sup>2</sup>) did not. The latter investigators based their conclusions on spasmodic samples. In the matter of disinfecting threshold of chlorine the findings presented bore out Fenton (Mallman<sup>8</sup>). Stovall and associates<sup>12</sup> believed that 0.15 to 0.20 p.p.m. were adequate residuals for effective disinfection though their observations were made in a pool with a filtration system. The Joint Committee requires a minimum residual of 0.4 p.p.m. for straight chlorine treatment. As to the delayed disinfecting action of chloramines Hinman and Beeson,<sup>5</sup> Gerstein,<sup>4</sup> Schmelkes and associates,<sup>11</sup> and Weber and associates<sup>13</sup> have established the matter in respect to drinking water treatment. Fletcher and Clark<sup>3</sup> briefly examined the matter in regard to swimming pool waters. They found that a 20 minute contact period was required, but felt that it was a satisfactory disinfection method.

The findings of this investigation indicate that the benefits of an exceedingly speedy concurrent disinfection of all washings and discharges from swimmers is lost when ammonia is used in conjunction with chlorine. Experimental data not presented showed that it was possible to maintain straight chlorine residuals in water of 90° F. for reasonable periods. It is believed that under the most unfavorable conditions of high loads, sunshine and hot weather, modern chlorine dosing equipment in the hands of competent operators is capable of maintaining adequate straight chlorine residuals. It is believed that the inferior disinfectant action of chloramines outweighs the advantage of maintaining residuals which give creditable but meaningless orthotolidine readings. Therefore it is believed that the addition of ammonia should be discouraged.

#### SUMMARY

The results of a series of observations at two public outdoor pools and in an experimental tank under varying chlorine and chloramine dosages indicated the following:

1. There is a high correlation between swimmer load and bacterial counts.
2. There is a threshold of chlorine disinfection between 0.10 and 0.25 p.p.m. above which effective bactericidal action is obtained.
3. The addition of ammonia results in a loss in concurrent disinfection and consequent delayed disinfection which is pronounced at chlorine residuals as high as 1.0 p.p.m.

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# Delayed Birth Registration\*

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THE tremendous increase in the demand for birth certificates for adults occasioned within the last two years by national defense has focused interest upon this problem. The Council of the Vital Statistics Section has requested that a brief report on the subject of delayed birth registration be made before the Section.

There are important reasons why a fundamental distinction should be made between registrations in infancy and registrations at adolescence or adulthood. In effect, a birth certificate is a statement of an individual, usually the attendant at birth, that a child was born to certain parents at a stated time and place. This certificate, if filed at or near the time of birth, enjoys exceptional prestige in the eyes of courts and other governmental agencies. This prestige derives from the legal presumption that the statements on the certificates are exceptionally trustworthy; first, because the maker of the certificate is likely to have observed and remembered the particulars of the birth correctly; and second, because there is ordinarily little motive for misstatement.

Statements made before there is a temptation for misstatement carry especial weight as evidence, so that they have acquired a special Latin designation, namely, "*ante litem motam*," meaning "before the litigation arose."

On the other hand, when a certificate is filed later in life, the foregoing pre-

sumptions no longer hold. We have abundant evidence that people become confused concerning birth dates and even birthplaces. Furthermore, adult registrations are usually requested because the registrant needs or desires to prove something; there is, therefore, frequently a powerful motive for misstatement of birth date or birthplace, and occasionally parentage. Experience having shown that unsupported registrations filed in adulthood are often incorrect, such registrations occupy in the eyes of the law and of governmental agencies, so low an estate that they too have acquired a Latin designation, namely, "*nunc pro tunc*," meaning "now, in place of then." To the cognoscenti, "*nunc pro tunc*" declarations are under a cloud of opprobrium.

There have evolved, therefore, within the last two decades, various special requirements for the delayed registration of births. These safeguards were occasioned by legislation in such fields as alien exclusion, child labor, veterans' pensions, poor relief, aid to dependent children, and, most important and recent, national defense.

In the last decade or so, a number of the border states, where the smuggling in of aliens became a problem, began to accept delayed birth certificates only after some sort of approval by a court. In 1933, a committee of this Section recommended that delayed registration through court procedure be made standard, but in the majority of states delayed registrations continued to be filed upon the certificate of an attendant, although in some cases supporting affi-

\* Read before the Vital Statistics Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 14, 1941.

davits were required. These affidavits too often were untrustworthy; nearly always they were, in effect, "self-serving declarations," and therefore of questionable evidentiary value. With the coming of the recent national emergency it became clear that more rigorous safeguards were necessary for delayed birth registration if the system was not to be thrown into discredit.

#### STANDARDIZING ACTIVITIES

Under the impetus of national defense activities, requests for delayed birth registrations increased tremendously during the spring of 1940, and there was a sudden awakening that co-operative action was imperative. As a result, in September, 1940, the U. S. Bureau of the Census, through initiative of Dr. H. L. Dunn, financed a meeting at Washington, D. C., of a committee appointed by President J. F. Blackerby, of the American Association of State Registration Executives. To this meeting were also invited the representatives of some twenty federal agencies. The conference first reviewed the evidentiary requirements of federal agencies for the establishment of place of birth, date of birth, and parentage in the absence of a certificate filed at birth. A set of standards was thereupon adopted by the Registrars' Committee which, after modification, was approved in principle by the federal agencies, by the Bureau of the Census, and in April, 1941, by the Conference of State and Territorial Health Authorities. Very recently the acting secretaries of War, Navy, and Commerce, at the request of Dr. Dunn, approved standards and recommended that they be used as a guide by state bureaus of vital statistics and by national defense industries.

In brief, the proposed standard method has the following features:

1. Delayed registration is defined as registration at or after the fourth birthday of a child.

2. The applicant is required to establish date of birth, place of birth, and parentage by three documents (baptismal, insurance, Bible, census, etc.) at least five years old. Two records will usually suffice if one was made before the fourth birthday. The requirements for proof of parentage have been eased somewhat by the Registrars' Association.

Two or more records are required, partly to save the applicant a trip or delay because too frequently one record has a flaw, such as an erasure, or an incorrect birth date or other error, or lacks proper authentication. A relatively low rating is given to affidavits of personal recollection, and to statements of physicians or midwives not supported by actual records.

3. A detailed abstract of the evidentiary records is to be given on the certificate and on copies thereof. This means, for example, that the abstract of a baptismal record will show the name and address of the church, the date of baptism and of birth, birthplace, and names of parents of the registrant as shown on the baptismal certificate. The standard certificate for delayed birth registrations shows this information in parallel column fashion, so that discrepancies can clearly be seen. Thus it is readily seen for example, whether a record gives the birth date explicitly, or only a statement of age on a specified date. Similarly, if one record states that an individual was born in Mississippi, and the second that he was born in Mexico, that conflict cannot escape notice.

Inconsistencies occur rather frequently, particularly on age statements. It would be thoroughly unsound to reject all cases which show any inconsistency; but it would be even worse to endeavor to conceal conflicts in records. To show the complete picture in the form of a detailed abstract is therefore only fair to the person who may use the record to make an important decision; the detailed abstract also relieves the registrar of embarrassing responsibility in doubtful cases, for he is in the position of merely setting forth the evidence, rather than of rendering a verdict. A court, governmental agency or other user of the certificate is thus permitted to make the decision for itself, as it should do in important cases.

## OFFICE PROCEDURE

In general, the procedure of delayed registration, although somewhat variable from state to state, is likely to be about as follows: The registrant applies for a birth certificate. If no certificate is on file he receives a blank application or certificate form and a statement of the evidence required. Many applicants, particularly in the laboring group, require assistance in making out their forms and in locating evidentiary records. Therefore, a personal interview is frequently necessary, either in the state office or in a branch; for example, the county health office. This local assistance is important if the program is to work smoothly. Application and evidence are transmitted to the state registration office where the evidence is carefully reviewed, an abstract thereof entered on the certificate, copies issued as required, and the certificate is filed. The great majority of states make no charge for the registration but do make the usual charge of fifty cents to one dollar for the certified copy.

It is usually necessary to return to the applicant such evidence as family Bibles, baptismal certificates, and insurance policies. It is therefore useful as well as extremely inexpensive, to make a microfilm copy of the records. The film record of a single document usually costs less than two-tenths of one cent. As this device is relatively new in health department circles, it is of interest that an exhibit of microfilm equipment was arranged in the exhibit section at the Atlantic City meeting.

Manuals and other administrative helps have been issued by the Bureau of the Census and the Committee on Delayed Birth Registration of the American Association of Registration Executives.

## ISSUES UNDER DEBATE

As the delayed birth registration procedure is relatively new it is to be ex-

pected—in fact it is probably desirable—that there be some variation in attitudes and practices in the various states. Thought on this subject has been so recent that it would probably do more harm than good to try to discourage initiative, experiment, and adaptation to local conditions.

The first point on which there is a considerable difference of practice is the question as to whether the evidence shall be evaluated and the decision as to registration made by a court or by the state registrar. At the present time a decision is made by courts or court clerks in the following states and possibly others: Vermont, New Jersey, South Carolina, Ohio, Nebraska, Texas, Michigan, Nevada, Oregon, and California. In some states the applicant has a choice of methods.

There is much to be said on both sides of this question, and possibly what is best for one state would not be best for another. The advocates of the court method point out that this procedure facilitates decentralization of work, as is necessary in large states; and that the employment of highly trained personnel by the state health department is thereby reduced. Opponents point out that the judges do not want the job and do not always perform satisfactorily. Moreover, say the opponents, the principal function of decentralization is to give advice and assistance to the registrant. This is not normally a duty of the judge, so that in the court procedure states it is frequently necessary for the applicant to employ an attorney at heavy expense. In California, the cost of delayed registration is said to be \$50 to \$100. In Nebraska it is \$2, but in that state the judges are raising the question of limiting petitions to attorneys. Moreover, some state registrars point out that if they must educate the applicant, search the files for a previous record, file the new certificate, and frequently educate the judge as to what is

necessary, the state registrar may as well do the intermediate job of evaluating the evidence. Therefore, although the court method has some strong adherents, as in Texas and Nebraska, and doubtless elsewhere, a majority of the state registrars do not favor it. In some states, however, where registrars have for financial or other reasons been unable to deliver the service demanded, the court procedure has been thrust upon them willy-nilly; in others, such as New York and New Mexico, the judges defeated legislation to establish the court method of filing delayed birth records.

A second subject of debate is whether the delayed registration certificate should contain the standard detailed abstract which cites *what* any record gave as to birth date (or age), birthplace, and parents' names, or whether, on the other hand, the certificate should only show by symbolic letters in a table *whether* a statement of specified type was made. Although the writer believes that the standard detailed abstract is advisable, even though it may add a cost of 20 or 25 cents per certificate, the question is clearly one in which experiment is desirable to determine whether the simpler procedure is practicable.

Finally, there is some discussion as to whether or not the delayed birth registration should attempt to establish identity. A proposal by the Bureau of the Census to place fingerprints upon the delayed registration certificate has been abandoned, but that Bureau and probably a majority of the registrars feel that the signature of the registrant should be upon the certificate, the in-

tention being that photostatic copies will show this signature and thus serve as a means of identification. To many persons, particularly to those who are not actually engaged in the work of registration, it will seem incomprehensible that a question should even be raised as to the desirability of establishing identity. Those who have reservations on this point, including the writer, point out that for the registrar to establish identity is an extremely difficult procedure, particularly at a time like the present. In the absence of ability to verify signatures more harm than good may be done by giving the "air of verisimilitude to a bald and unconvincing statement." Registrars know that when the registrant is at a distance the application and data for the certificate will very probably be filed by a member of the family who will not hesitate to sign the registrant's name to promote the prompt issuance of a certificate.

Therefore, without wishing to oppose the establishment of identity on the birth certificate, the writer wishes to emphasize that the subject should be approached as a field of experiment, and that the establishment of identity should not be imposed by mandate upon a registration system which is groaning under the effort to establish those data which are demanded of registrars by employers, and governmental agencies. Eventually, when this work can be done under less unfavorable conditions, it is quite possible that a system of identification should be linked not only to delayed birth registration, but to that far more conclusive document, the birth certificate filed in infancy.

# The Functioning School Lunch\*

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ONE cannot discuss the assigned topic without a preliminary statement about the function of the school lunch, whether provided by home, school or nearby restaurant, or the corner store. The noon meal selected by school children should be interesting to eat and should provide each day approximately one-third of the nutrients needed regularly for normal growth and for the maintenance of good health. Too often the school lunchroom is not a functioning part of the educational program of the school but is merely a convenient place where teachers and pupils can buy something to eat. Many home-packed lunches are so uninteresting that they are not eaten. Children who bring unsuitable lunches from home, or who eat undesirable types of lunches at home or elsewhere, and their parents need instruction to help them correct these conditions. Parents as well as pupils should be taught what foods are of special importance to children and why. Communities should see that provision is made for free lunches for indigent children, since this cannot be the direct responsibility of the school board.

*The school lunchroom should provide the right kind of food for the children.*

The first step in accomplishing this is to have a form of organization of the lunchroom that makes for maximum coöperation and efficiency. A school that undertakes the responsibility for serving

noon lunches should see that the lunchroom is under the control of the faculty and school board. Policies under which the lunchroom operates should be outlined by a lunchroom committee and approved by the school board. The lunchroom committee should be composed of at least two teachers (one of these being the home economics teacher if there is one on the staff), one representative each from the student body, parents and school board, and either a physician or nurse. The home economics teacher is the logical person to serve as manager, to see that these policies are carried out. She should, however, be given time in her schedule to devote to lunchroom management problems.

All over the country state nutrition defense committees are now being organized and these in turn are encouraging the organization, within each county, of county nutrition defense councils. One of the duties of these county councils would seem to be the formation of a county school lunchroom advisory committee to work with local lunchroom committees within the county. The county committee could also be of great help to school and community libraries in the selection of reliable and up-to-date books and pamphlets on the relation of food to health. The county advisory committees should be made up from the following types of persons: county health commissioner, public health nurse, home demonstration agent, home supervisor for farm security administration, dietitians and home economists who may be employed in the county by hospitals or colleges or who

\* Read at a Joint Session of the American School Health Association and the Food and Nutrition and Maternal and Child Health Sections of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 17, 1941.



are married but willing to help solve county problems, and a representative of the parent-teacher group. This county committee may call upon various state representatives for advice and help: nutritionists and sanitarians of the state health department; nutritionists on the staff of the state agricultural extension service; state supervisors of vocational home economics of the state department of education; the director of school lunchroom projects for the Works Projects Administration; the state distributor of surplus commodities, and other members of the state nutrition defense committee.

The most successful school lunchrooms are those whose policies are based on knowledge of the food habits in the homes represented in the school. Cooperation of teachers, public health nurses, and parents is needed in securing this knowledge.

The second step in providing suitable foods for the children is to see that the type of service in the lunchroom is one that insures the selection of a satisfying meal. In many rural consolidated schools and urban elementary schools a plate lunch is the only food offered, except possibly a few supplementary foods for those with extra money and extra appetites. Children should not be allowed to buy these supplementary foods in place of items on the plate lunch. In other schools one or two plate lunches are offered as alternatives to free cafeteria choice. Other schools offer independent cafeteria choice only.

It is desirable that all school lunchrooms offer to pupils each day a special plate lunch at the lowest possible cost. When managers of cafeterias first introduce the plate lunch they often make the size of servings distinctly smaller than pupils get who purchase portions served "à la carte." They do this apparently in order to avoid loss of money. This, however, defeats the purpose of the plate lunch special, for there is

then no incentive to buy it, since it is not a bargain! School lunchroom managers should know the actual cost to them of servings of the foods they offer for sale, in order that, in planning plate lunch menus, actual money loss is avoided. The cost of the special plate should represent rock bottom minimum of profit, reliance being placed on volume sales to add to net profit. Commercial departments in high schools could profitably help in necessary cost studies.

The plate lunch plan of operation, with no cafeteria choice, reduces the number of foods to be prepared each day and enables the cooks to concentrate on making what is served unusually good. It permits wiser buying and more economical management. It makes possible considerable variety in menus from day to day and week to week, with less repetition. It teaches children what constitutes a well balanced meal and acquaints them gradually with a wide variety of foods.

When a school lunchroom serves children in the elementary grades, a plate lunch is of extreme importance. Small children have a great deal of difficulty both in seeing what is on a cafeteria counter and in deciding what they want. Sometimes teachers accompany first and second grade children to help them, but their judgment is not always sound. Seldom is help of any kind given to children beyond the second grade. It is of the greatest importance to help young children in their food choice if there is to be substantial progress in the development of good food habits.

The well planned plate lunch provides an excellent opportunity for teaching good food habits and greatly strengthens the health education program of the school. Teaching food habits out of supplementary readers is not effective. Neither can teaching food habits be effective without an intimate knowledge of the food problems of the pupils. If

the teacher knows the food habits of her pupils and wants to help correct them, she can accomplish a great deal, often more than any other one person. Teachers need guidance in this field of health education, however, and they need reliable reference material. They often need to correct their own food habits as well as those of their pupils. Knowledge of nutrition is not intuitive and instruction in nutrition is not yet a part of the required educational program in all teacher training institutions.

The third step in a program for supplying adequate school lunches is for the faculty, pupils, and parents to develop a consciousness of what is a suitable lunch for children, and for the manager to develop the ability to interpret this consciousness in the form of well planned menus that the lunchroom can afford to provide for the price the children can pay. Observations in many schools and knowledge of child food habits in many communities have led to the development of a standard pattern for a satisfactory plate lunch. This type of lunch has been found to fit the nutrition-health needs of a large percentage of school children and should be followed carefully in all feeding programs for needy children where lunches are provided without cost. The lunch planned along the lines of this standard pattern is quite universally known as a Grade A Lunch. It consists of:

*Milk:* One-half pint to drink, either as plain pasteurized milk or cocoa which has been made with milk, or one or two dishes rich in cheese or milk. Whether one or two such dishes should be included on a given menu, to replace milk or cocoa, depends upon the amount of milk represented by a serving of the food in question.

*Vegetable or Fruit:* One serving, raw whenever possible, with yellow or green varieties served frequently.

*Main Dish:* One serving, usually, of a hot food which has real staying or satisfying value. This dish should contain some meat or meat substitute.

*Bread and Butter:* Use at least as much dark bread as white bread. The white bread

that is used should be "enriched." When bread is served as a sandwich which contains meat or meat substitute, the hot dish need not be a meat or meat substitute type but may, for example, be a cream soup or thick vegetable soup.

Complete files of the menus served throughout the school year should be kept by every school lunchroom manager. Whether responsibility for the school menu rests with the home economics teacher, some other teacher, some committee, a WPA supervisor, or even with the cook, it is important that a complete collection of the menus be available for reference in succeeding years. Too often, with a change in personnel, there is nothing to guide new workers. Such menu records are of inestimable value if they are accompanied by brief comments, easily recorded on the back of each week's menus, as to the popularity of the foods served, their cost, suggestions for future modification, preparation difficulties, quantity prepared, source of recipes, etc.

*Technics that have been used successfully in teaching children and communities lunchroom policies and the importance of good food habits:*

The following suggestions are based on several years' experience serving as consultant to health departments and school superintendents on school lunchroom problems.

1. A plan found to work splendidly in acquainting the community with the problems of the lunchroom is that whereby the parent organization requires each of its members in turn to assist in the lunchroom one or more days each year. This develops a mutual understanding of the variety of problems involved.

2. A special parents' day may be planned each year to give parents an opportunity to survey the lunchroom and to learn something of the policies and problems involved in providing adequate lunches for their children. Parents should be encouraged to visit the lunchroom occasionally during meal service to see how the food is served and what it tastes like.

3. The lunchroom committee should sponsor talks to pupils, parents, and the community on child feeding problems, meal planning, etc., using the available professional personnel of the county and state previously mentioned.

4. One of the most effective methods of teaching the relation of food habits to health is to conduct simple animal feeding demonstrations which are closely followed by all of the pupils attending the school and by their parents. Manual arts classes may make the cages at very low cost; home economics classes may be responsible for the food; science classes may take care of the animals, plot growth curves, etc. Such demonstrations should be supervised by a person who understands the technic of animal feeding experiments and knows how to handle the animals. I cannot recommend too highly for school people interested in such methods of visual education a recent publication from the State College of Washington Home Economics Department.\*

5. Home Economics classes can, at suitable times, prepare demonstrations of appropriate breakfasts and of desirable types of home-packed lunches, using foods that are economically possible for the parents to provide. These demonstrations should be shown in each classroom and, whenever possible, to the parent-teacher organization. In some schools elementary grades make special studies of breakfasts and lunches for school children.

6. The lunchroom will increase in popularity as the children in the school participate in helping solve its problems. Art classes can help in many ways to carry out ideas suggested by the lunchroom committee. Industrial arts classes may make many simple pieces of needed equipment and work on refinishing problems. English classes can just as easily write themes on food-health topics as on other topics. Drama classes often write and present clever nutrition plays. Commercial classes may learn valuable lessons in book-keeping, as well as in food costs, from working on lunchroom records. Various departments of the school, civics classes, hygiene classes, etc., should cooperate with the manager and health commissioner in making the school lunchroom the equivalent of a grade A restaurant in serving only clean, wholesome food.

7. In some schools a certain week in the school year has been called Vitamin Week or Nutrition-Health Week. Through a special

edition of the school paper, special assembly programs and attractive educational exhibits, a valuable educational program may be presented to the school and community. During this week, with the help of special groups of students, the grocers in the community may cooperate with special window displays of protective foods, or with an exhibit of a week's grocery order that would provide a family of specified composition with all needed foods in sufficient amount at minimum cost.

8. In one school the manager encourages pupils and teachers to submit menu suggestions and quantity recipes for any new foods that are included. When she is able to use the menu, she names it for the person who submitted it, and gives this person a free lunch on the day it is served.

9. In one school the popularity of the lunchroom is greatly enhanced by the fact that student helpers are chosen from the boys who are top notch leaders in the school.

10. If an elementary teacher has good food habits, she may increase her influence with her pupils by eating with them, and vice versa! In one school mothers reported that their children were demanding milk in their lunch boxes because their new teacher always brought milk in her lunch box.

11. Foods quite different from those generally used in a community should be introduced into the plate lunch very slowly. Free samples may even be given the first time the food is served. Classroom teachers should teach the value of new foods in advance of their inclusion in plate lunch menus.

*Some of the objectionable dietary practices followed in some schools and how they may be controlled:*

*Sale of Candy*—This is frequently sold in school lunchrooms in order that profit from its sale may offset losses from the poor sale of other food; or it may be sold in other parts of the building by groups of students who wish to raise money to support some legitimate school activity. Candy supplies chiefly calories and sweet flavor and is a non-essential. The regular use of food containing such a high concentration of sugar is also an important factor in the appalling incidence of dental caries among school children.

*Sale of commercial fruit beverages and soft drinks*—These contain sugar in

\* Todhunter and Andes. *Nutrition Experiments for Classroom Teaching*. State College of Washington, Pullman, Wash. Price, \$25.

varying amounts; from practically none to usually not over an ounce of fruit; often citric acid to improve the flavor; and much water. They contribute little to the nourishment of the child.

*Sale of many "penny snatcher" foods*—These include potato chips, pop corn, crackers, pretzels, cookies and cakes.

All of these types of foods divert the child's meager lunch money from the purchase of needed nourishment. The average child has not over 10 cents for his whole noon meal. Every penny of this amount that is spent unwisely is spent at the sacrifice of some of his daily food needs. What measures may be taken to eliminate or greatly reduce the sales of such foods?

Some courageous school superintendents forbid all who cannot go home for lunch from leaving the school grounds during the school day, and thus minimize the possibility of patronizing corner stores. To carry out this program successfully, the superintendent must have an equally courageous school board and the sympathetic coöperation of the parents. In some communities there are ordinances forbidding vendors of soft drinks and "penny snatcher" foods from selling their wares within 500 feet of the school grounds.

In schools where these supplementary foods have long been sold and where antagonism might be created if they were suddenly withdrawn, their sale has been discouraged with the full understanding and coöperation of the parents, in the following manner: Meal tickets are sold at from 10 to 20 per cent reduction in price, as an inducement to parents to provide them for their children. These tickets cannot be used in

the purchase of candy, soft drinks, and other types of foods discussed above. The children must have cash in hand to pay for all such articles and the school is justified in making a much higher profit from their sale than from the sale of foods that are necessary to make a nutritionally adequate meal. This method also greatly reduces purchases at nearby stores and puts the responsibility squarely on the shoulders of the parents who provide their children with cash instead of meal tickets.

#### SUMMARY

We have discussed methods for developing policies under which school lunchrooms should be operated, and have indicated what persons can make contributions to a strong school lunch program. Various forms of food service are outlined and the many advantages of the simple plate lunch, or of the plate lunch special, are presented, together with the generally accepted pattern for the Grade A lunch. Many suggestions are offered for making the lunchroom and the noon lunch eaten by the children an integral and vital part of the health education program of the school. There is also a discussion of some of the undesirable dietary practices followed in many schools.

In conclusion may I suggest that, where an approved lunchroom can be developed, careful studies be made by the teachers and health department personnel of the effect of this program on the continuous growth record of the pupils, and on their absence records and progress in school. I believe that valuable support for such a program can thus be obtained.

# Epidemic Influenza\*

## Epidemiological, Clinical, and Laboratory Aspects of the 1940-1941 Outbreak in St. Louis

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IT is the purpose of this paper to report the results of virus neutralization and complement-fixation tests on acute and convalescent-phase serum specimens from patients with epidemic influenza, and to correlate clinical, laboratory, and epidemiological observations. Similar analyses were made with specimens obtained from persons with acute non-influenzal respiratory diseases in an effort to differentiate true influenza from its imitators. Several institutional outbreaks afforded an excellent opportunity to study the disease in its various aspects, and to ascertain the practicability of laboratory methods now available for the study of this disease.

Although influenza was made a reportable disease following the epidemic of 1918, statistical data pertaining to its prevalence are not accurate because of inadequate morbidity reporting; nevertheless, an attempt is made to indicate chronologically the movement of the epidemic of 1940-1941 in the United States.

According to the weekly reports of the U. S. Public Health Service, an unusual incidence of acute respiratory infections was reported in California during the last week in November, 1940.

This epidemic reached its peak in California during the week ending December 14. The next week peaks in reported cases were reached in the states neighboring California, and by the end of the month the disease had spread into the South Central states and North Central regions. As the number of cases on the West Coast declined, the incidence in the South Central regions continued to increase. The St. Louis peak was reached by January 11, 1941, and within two weeks the epidemic had reached Ohio, Pennsylvania, and some of the New England states. The number of cases reported by the East Atlantic and Southeastern states reached a peak at this time while the Mountain and Pacific regions, where the epidemic started, continued to show a sharp decline. By the week ending February 1, 1941, decreases in the incidence of influenza were reported from all geographic areas except the Middle Atlantic and some of the North Central states. In various sections of the United States recrudescences were reported after an interval of several weeks. An institutional outbreak occurred in St. Louis several weeks after the city-wide outbreak had subsided.

Shortly after the outbreak in California, Dr. B. P. Brown, State Director of Public Health, reported that the epidemic was due to infection with the Type A influenza virus. Soon after the

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\* Read before the Laboratory Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 17, 1941.

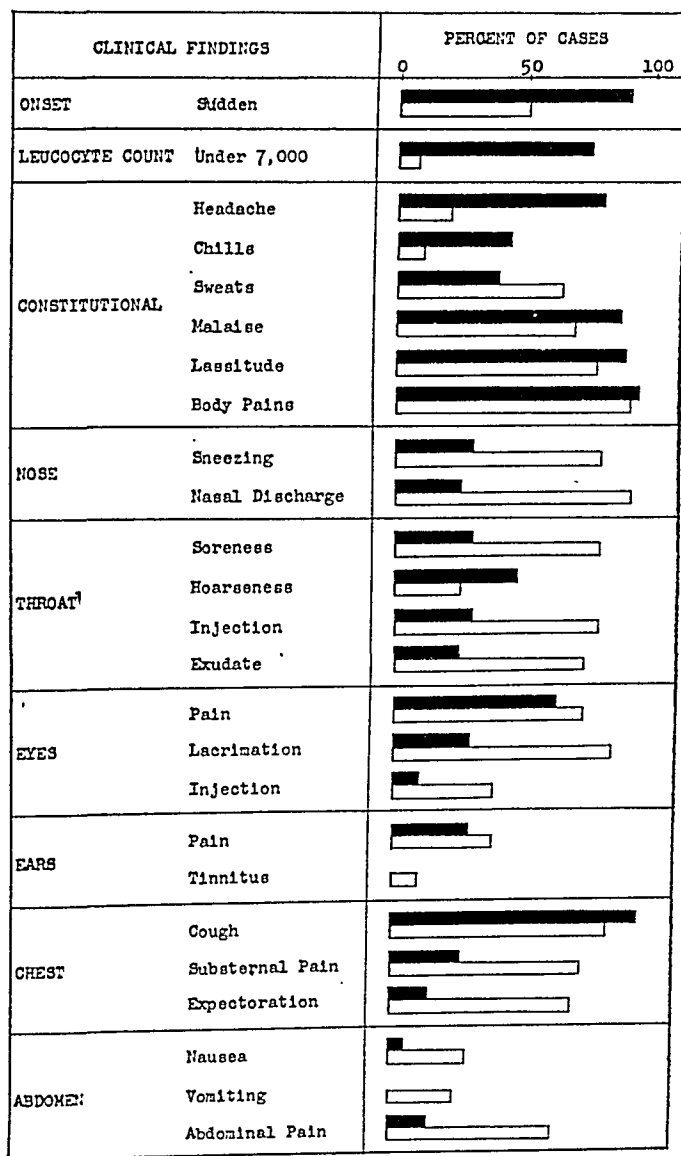
St. Louis peak, we found that the Type A virus was the cause in this city, and within a few weeks Dr. Morris Schaeffer, of the Bureau of Laboratories of the New York City Department of Health, stated in a personal communication that human influenza Type A virus was isolated from washings obtained from cases occurring in Letchworth Village, New York.

An interesting feature of the nation-wide outbreak was the speed with which it spread throughout the country, traveling from the West Coast to the East Coast in less than two months. The course of the present outbreak resembled that of previous epidemics of 1928-1929 and 1932-1933. The major epidemic of 1918-1919, on the other hand, began in the New England states and traveled westward and southward.

Epidemiologically and clinically the 1940-1941 outbreak of epidemic influenza in St. Louis resembled those which have occurred repeatedly since the great pandemic of 1918-1919. The epidemic, which was quite explosive in character, started the week ending December 21, 1940, and continued until the end of February, 1941. A total of 120 patients were studied, including 70 white males, 25 white females, 24 colored males, and 1 colored female. The ages ranged from 6 to 64 years. Data concerning age, sex, color, date of onset, date of confinement,

duration of illness, clinical findings, and clinical pathological findings were obtained by means of questionnaires.

The clinical findings in the cases proved to have epidemic influenza were as follows: The onset of the disease was abrupt, with predominating symptoms of fever, headache, generalized body aches, prostration, slight throat irritation, and persistent dry cough. No un-



- Cases of Epidemic Influenza  
 - Upper Respiratory Infections other than Influenza

FIGURE 1—Frequency of clinical symptoms in proven cases of influenza and patients with acute non-influenzal respiratory infections

usual findings were observed on physical examination. The fever usually subsided in 3 to 5 days. A high percentage of the cases showed uniformity of symptoms, and complications were relatively infrequent. The average duration of the symptoms was about 5 days. The height of the pyrexia varied from 100° F. to 105° F. and the duration of the fever was about 3 to 4 days. The disease was characterized by a prolonged and uneventful convalescence, the patient appearing pale and indisposed for several days without symptoms except for a slight cough and a feeling of lassitude.

The frequency of various clinical findings among the proven cases of influenza have been compared with those of patients with acute non-influenzal respiratory infections. The differential clinical features are presented graphically in Figure 1. It will be noted that respiratory complaints appear to be prominent in the non-influenzal cases, whereas they are minimized in the true influenzal patient. The frequency of the various symptoms in the influenzal group bear a striking resemblance to those reported by Horsfall and associates in their study of the 1939-1940 outbreak in Yorktown Heights, New York.

That the 1940-1941 outbreak of influenza was relatively mild is suggested by the infrequency of complications. During the epidemic period only 85 cases of broncho or lobar pneumonia, complicating upper respiratory infections, were reported to the Pneumonia Control Service of the Health Division, and only 25 deaths attributable to pneumonia, preceded by upper respiratory diseases, were reported to the Registrar of Vital Statistics. These figures are only slightly higher than those of previous years.

Conflicting reports have appeared in the literature concerning the value of the leucocyte count as an aid in the diagnosis of epidemic influenza. Since the

leucocyte counts available for analysis in the present study were made by the physicians submitting cases for investigation, they are subject to considerable variation. Of the proven cases of influenza, 28 per cent had a leucocyte count over 7,000 per cu.mm. and the count averaged 6,044 per cu.mm. disregarding the day of the disease. When the count was made during the first 3 days, the average number of cells was 5,463 per cu.mm., while an average of 7,883 cells was found if the counts were made during the 4th, 5th, or 6th day of the disease. Of the proven non-influenzal cases, 93 per cent had a leucocyte count over 7,000 cells per cu.mm. The results are summarized in Figure 2. Similar observations were reported by Francis, and more recently by Reyersbach, Lenert, and Kuttner. These observations suggest that low white blood cell counts or the absence of a definite leucocytosis during the

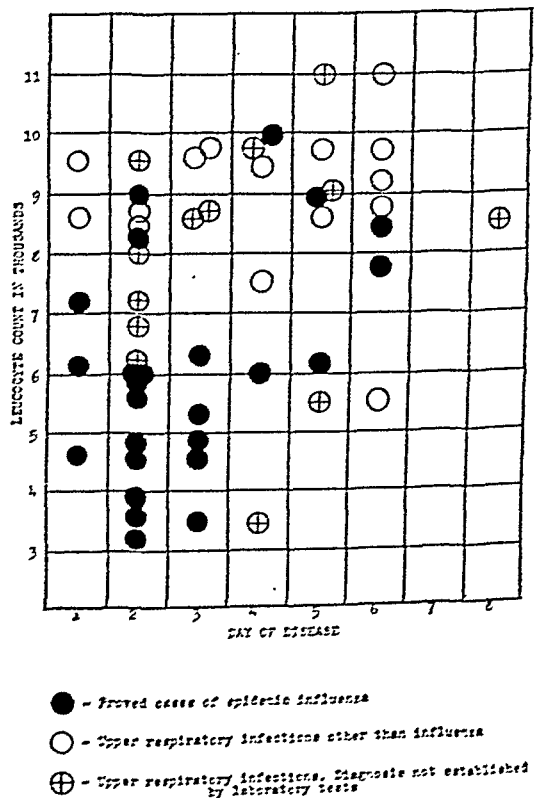


FIGURE 2—Significance of leucocyte count in influenza

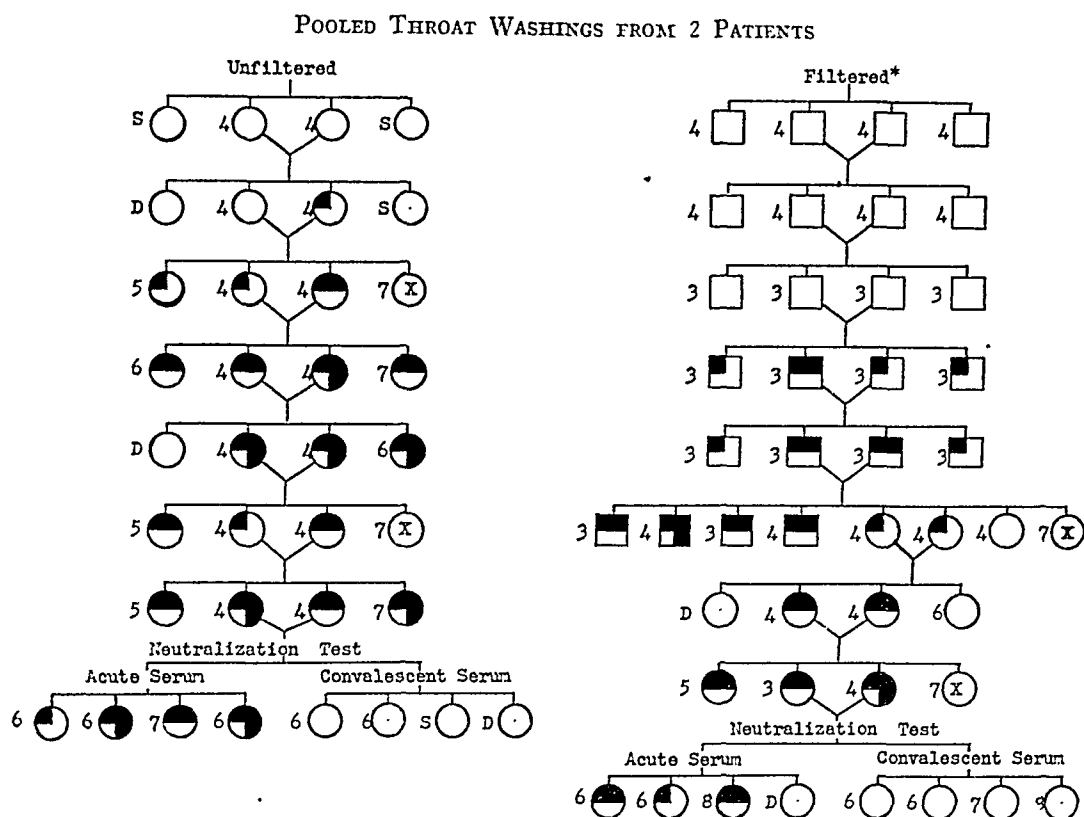


FIGURE 3—Demonstration of virus in pooled unfiltered and filtered throat washings by serial passage in mice and developing chick embryos

\* Filtered through a Berkefeld V candle.

Circles represent 3 to 4 week old Swiss mice.

Squares represent 10 to 12 day old chick embryos.

Numbers represent day of death or day sacrificed.

Shading indicates extent of pulmonary consolidation or degree of involvement of allantoic membrane.

S—mice survived 15 day observation period.

D—mouse found devoured; no examination made.

X—animal not autopsied.

early days of the disease is significant.

"Garglings" were obtained from a few representative patients within the first two days after the onset of the disease. A few ml. of sterile infusion broth were dropped into the nostrils of the patient, followed by gargling approximately 30 ml. of broth. The washings were immediately frozen and transported to the laboratory.

A filterable infectious agent, later identified as human influenza virus, was recovered from throat washings by direct inoculation into mice and on the allantoic membrane of developing chick embryos. Details of some of the mouse and chick passages are presented graphically in Figure 3. The identity of the

virus producing pulmonary lesions in mice and macroscopic changes on the allantoic membrane of the chick after the 4th serial passage was established by means of a protection test with a sample of convalescent-phase serum known to contain both complement-fixing and neutralizing antibodies. The virus was found to be immunologically related to Type A strains of human influenza virus (PR-8 and W.S.) isolated during previous influenza epidemics. The recovery of virus by serial passage in mice and developing chick embryos, without resorting to preliminary passage in the ferret, corroborates the reports of other investigators.

The results of parallel neutralization



and complement-fixation tests on acute and convalescent-phase serum specimens from 27 patients with influenza are presented in Table 1. The acute-phase blood specimens were obtained an average of 3.5 days after the onset of the disease, while the convalescent blood sera were obtained, on the average, 18 days after the onset of the disease. The mean neutralizing antibody titer of the acute-phase sera was 1:6 and the mean titer of the convalescent sera was 1:93. The mean complement-fixing titer of the acute-phase sera was 1:3.8 and the mean titer of the convalescent sera was 1:38. A significant increase in complement-fixing antibodies was demonstrable in the con-

valescent-phase serum specimens from all but one of the patients. Virus neutralizing antibodies were demonstrated in this serum specimen, and influenza A virus was recovered from throat washings of this patient. Complement-fixation tests on serum specimens from 5 of the patients, using lung suspensions from mice infected with influenza B virus (Lee strain) as the antigen, were conducted by Dr. Edwin H. Lennette of the Rockefeller Institute. None of the sera tested with the Type B influenza virus showed an increase in specific complement-fixing antibodies in the convalescent-phase serum specimens as compared with the acute-phase specimens. Specific complement-fixing anti-

TABLE 1

*Results of Neutralization and Complement-fixation Tests on Blood Specimens from Each of 27 Patients with Epidemic Influenza*

Patient	Day of Disease		Neutralization Test		Complement-fixation Test	
	Acute-Phase Blood	Convalescent-Phase Blood	Acute-Phase Blood	Convalescent-Phase Blood	Acute-Phase Blood	Convalescent-Phase Blood
C Ju †	4	21	1:9	1:89	1:4	1:32
A Ri	1	10	1:6	1:85	0	1:16
F Mi	3	18	1:9	1:90	0	1:32
J Ki	2	19	1:5	1:60	0	1:32
B St	2	14	1:6	1:175	1:4	1:64
A Ki	2	20	0	1:79	0	1:64
A Am	5	26	0	1:68	1:4	<1:16
B Si	2	11	1:12	1:125	0	1:32
F Ne	3	21	1:4	1:75	0	>1:64
J Ke*	1	16	1:6	1:85	0	0
M Co*	1	16	1:8	1:90	1:8	1:64
E Gr*	1	16	0	1:64	0	1:32
D Ec*	2	18	1:12	1:100	—	1:32
J Su†	3	17	0	1:110	0	1:16
L Re†	5	19	1:5	1:64	0	1:32
K Br†	2	16	1:6	1:90	1:4	>1:64
S Br†	4	17	1:12	1:192	0	>1:64
J Sa	4	15	0	1:40	1:16	>1:64
A El	6	22	1:8	1:93	1:16	1:64
F Wi	2	22	1:11	1:65	1:8	>1:64
J Sm	8	31	1:8	1:64	1:8	1:32
L Le	2	11	1:8	1:40	0	1:64
S St	8	21	1:7	1:58	1:4	>1:64
N Tr	7	17	1:5	1:95	—	—
T Tr	4	15	1:8	1:64	—	—
L Tr	3	16	1:9	1:105	—	—
A Ge	6	28	0	1:55	0	1:32
Mean	3.5	18.3	1:6	1:93	1:3.8	1:38

\* Virus demonstrated in throat washings from these patients.

† Complement-fixation tests with type B influenza virus (conducted by Dr. Edwin H. Lennette) showed no increase in specific antibodies in the convalescent-phase specimens as compared with the acute-phase specimens.

— Not done.

bodies against the Type A influenza virus were demonstrated in the corresponding sera. In interpreting the results of the complement-fixation tests an increase in titer of twofold or greater was considered significant evidence of an antibody response. In our experience, the level of antibodies indicative of epidemic influenza was found to be near a titer of 1:16 in terms of the original dilution of the serum.

The results of complement-fixation tests on two blood specimens from each of the patients with epidemic influenza and acute non-influenzal respiratory diseases are summarized in Table 2.

however, some differences occur. Respiratory complaints appear to be common in the non-influenzal cases, whereas, they are minimized in the true influenzal patient. Low white blood cell counts, or at least the absence of a definite leucocytosis during the early days of the disease, is of diagnostic significance in influenza. Because of the difficulty in differentiating true influenza from other respiratory diseases, confirmation of clinical diagnosis must depend upon the use of laboratory aids, especially since the presence of an epidemic in a community may color the diagnostic viewpoint. It has been the purpose of this

TABLE 2

*Results of Complement-fixation Tests with Epidemic Influenza Virus on Two Blood Specimens from Each of the Patients with Upper Respiratory Infections*

Cases	Number of Cases	Acute-Phase Blood	Convalescent- Phase Blood	Per cent of Cases with Increase in Titer
		Mean Titer	Mean Titer	
Epidemic Influenza	54	1:3	1:47	98.14*
Other Upper Respiratory Diseases	24	1:7	1:8	12.54†

\* One patient's serum showed increase in neutralizing titer but no increase in complement-fixing titer.

† Convalescent serum specimens obtained during the epidemic period from 3 patients showed slight rise in complement-fixing antibodies.

Of the 54 cases of epidemic influenza studied, 98 per cent showed a significant increase in complement-fixing antibodies in the convalescent-phase serum specimen. The mean titer of the acute-phase serum was 1:3 and that of the convalescent serum was 1:47. The convalescent-phase serum specimens from 3 of the 24 patients with acute non-influenzal respiratory infections showed an increase in complement-fixing antibodies. Since these blood specimens were obtained during the epidemic period it is possible that the cases were contacts or had coexisting influenzal infections.

The clinical symptoms accompanying the early stages of epidemic influenza are common to numerous other respiratory diseases; as the disease progresses,

investigation to correlate laboratory, clinical, and epidemiological findings to enable the practising physicians to dissociate true epidemic influenza from the mosaic of other respiratory infections.

During the outbreak under investigation, human influenza A virus was isolated by serial passage in mice and developing chick embryos without preliminary passage in the ferret. The virus was found to be immunologically related to other Type A strains of human influenza virus isolated during previous influenza epidemics.

Although the most conclusive evidence of influenzal infection is available when virus has been recovered from throat washings of a given patient and an increase in neutralizing and complement-fixing antibodies demonstrated in

the convalescent serum of the same patient, correlation of laboratory and clinical findings show that the serological procedures now available are applicable even in the absence of virus recovery. Furthermore, antigenic differences which may exist between the various strains of the same virus type do not interfere with the use of the serological tests in the diagnosis of this disease.

Correlation of clinical findings with results of the neutralization and complement-fixation tests are presented. The authors believe that the complement-fixation test is a simple specific serological procedure which does not require highly trained personnel or special equipment. The practicability and accuracy of this test have been emphasized by other investigators. The neutraliza-

tion test, on the other hand, is a more complicated and delicate procedure. It is suggested that public health laboratory workers throughout the country familiarize themselves with the complement-fixation test for influenza in order to be prepared for future outbreaks.

#### ADDENDUM

Since this manuscript was submitted for publication additional *in vitro* tests have been described by Goodner (*Science*, 94:241, 1941), Roberts and Jones (*Proc. Soc. Exper. Biol. & Med.*, 47:75, 1941), and Hirst (*Science*, 94:22, 1941, and *J. Exper. Med.*, 75:49, 1942). Experiments are now in progress to determine the practicability of these tests as compared with those described in this paper.

# Studies on Aberrant Coliform Bacteria\*

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NORMAL coliform bacteria dissimilate lactose with the prompt production of acid and gas. On the other hand, the aberrant coliform bacteria ferment lactose slowly, with acid production only, at low temperatures only, with partial gas production only, or even not at all,<sup>†</sup> and present many real problems.

Stuart, Mickle, and Borman<sup>1</sup> have suggested a grouping of these bacteria which marks a distinct advance in a difficult field. The present report is concerned with one of the four Stuart groups, namely,

GROUP III. "Papillae-forming coliforms—aberrant coliforms showing the type of dissociation evidenced by *Bacterium coli mutabile*, but not confined to the genus *Escherichia*."

We agree fully with Stuart and co-workers that: "The papillae-forming group will be detected only infrequently in routine coliform estimates in which gas production is used as the criterion for their presence and the anaerogenic group will not be detected at all. However, these two groups may be highly significant because of their frequent association with gastroenteritis and genitourinary infections." It is obvious that any new light on the behavior and relationships of these organisms is

significant for sanitary bacteriology.

Beginning March 15, 1940, the "bacteriological autobiography" of one of us,<sup>3</sup> previously reported in some detail was resumed. By March 11, 1941, 25 additional fecal specimens had been examined. A small portion of each sample was suspended homogeneously in 30 ml. of saline and plated in varying amounts on at least three Endo's agar plates. From each of the resulting sets of plates colonies were picked for study. It was noted that colorless colonies typical for *Bacterium coli-mutabile* were present in every one of the 25 specimens and that on only 15 sets of plates were any colonies present of the type commonly attributed to *Escherichia* or *Aerobacter*.

In the case of each of four of these samples showing practically pure cultures of aberrant coliform bacteria 100 well isolated colonies were fished to phenol red lactose broth. At the end of 48 hours 361 of the fishings either had not shown evidence of fermentation at all (33), had produced only acid (61), or had given rise to an acid reaction with just a trace of gas (267). At the end of 7 days, 2 were "growth only," 28 "acid only," 237 "acid with trace of gas," and only 133 showed acid and normal gas production. Thus, even after 7 days' incubation, 267 of the 400 colonies picked would have failed to give a positive presumptive test.

Realizing that such procedures are too crude for any significant results to be deduced because the colonies may not

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† Parr<sup>2</sup> includes certain lactose negative organisms in the coliform group under the designation of "para-colon bacteria."

be pure and because of uncertainty of colony relationship, we determined to see what would be the reaction in series of lactose broth tubes if colonies from pure cultures of Group III aberrant coliform bacteria were used. We had available for study a number of such strains obtained from colleagues at Brown, Maine, Kansas, Tennessee, and from our own work. Pure strains of papillae-forming coliform bacteria were plated from broth culture to Endo's agar. From each resultant growth, at 24 hours, 10 colonies were picked at random to 10 tubes of phenol red lactose broth. The 10 tubes were incubated at 37° C. and observed daily for at least 10 days before any tubes were discarded. Tubes showing acid production only, or partial gas production only, or growth only, were held for much longer periods of time, often 5 to 6 weeks. Whenever the purpose of the study demanded, plates were made from selected lactose broth tubes in the series and colonies again inoculated into lactose broth and observed.

Since the Group III aberrant coliform bacteria are slow fermenters of lactose, it is not to be expected that any lactose

broth tube inoculated from a colony will show acid and gas in 1 day, necessarily, or even in 2 or 3. One would expect, however, that when evidence of fermentation begins to appear it should do so in all 10 of the tubes inoculated in the series at approximately the same time. The original *inocula* used are, of course, unequal in quantity and this might occasion some slight differences, but on the assumption of stabilized and similar essential structure of the bacterial cells involved, such differences in appearance of acid and gas in the several tubes should be small and these differences should be haphazard and not correlated with other characters of the growths under observation.

Such, however, was not the case with the cultures tested. What did happen was that, after a lapse of time during which the only recording for all tubes was "growth only," certain of the tubes, usually from 1 to 4 of the 10, suddenly produced "acid and gas." The other tubes remained "growth only." If a tube showing the sudden, though late, fermentation was plated on Endo's agar, two types of colonies developed within 24 hours, the metallic red colony

TABLE 1

*Lactose Broth Inoculations After 2, 3, 7, and 10 Days of Incubation at 37° C.*

Run	Two Days				Three Days				Seven Days				Ten Days			
	Growth only	Acid	Acid, trace gas	Acid and gas	Growth only	Acid	Acid, trace gas	Acid and gas	Growth only	Acid	Acid, trace gas	Acid and gas	Growth only	Acid	Acid, trace gas	Acid and gas
16	9	0	0	1	9	0	0	1	4	2	2	2	0	6	0	4
39	7	0	0	3	7	0	0	3	5	1	0	4	0	4	1	5
54	8	0	0	2	7	0	1	2	5	1	1	3	1	5	1	3
94	9	0	0	1	8	0	0	2	3	4	0	3	1	5	1	3
137	10	0	0	0	10	0	0	0	4	1	5	0	1	2	3	4
212	9	0	0	1	9	0	0	1	4	5	0	1	1	5	3	1
414	10	0	0	0	8	1	0	1	2	6	0	2	0	5	3	2
415	10	0	0	0	7	1	0	2	2	5	0	3	0	3	4	3
445	9	0	0	1	0	9	0	1	0	8	0	2	0	6	2	2
457	10	0	0	0	7	1	1	1	0	3	5	2	0	3	6	1
462	10	0	0	0	9	0	0	1	5	0	0	5	1	1	3	5
476	10	0	0	0	7	0	0	3	0	0	0	10	0	0	0	10
514	6	0	2	2	6	0	0	4	0	6	0	4	0	5	1	4
562	10	0	0	0	9	0	0	1	2	2	0	6	0	0	4	6
601	10	0	0	0	8	0	2	0	3	0	3	4	0	1	5	4

characteristic of a prompt fermenter and the colorless colony characteristic of an aberrant coliform strain. The tubes which remained "growth only" at this stage eventually progressed to (1) acid production, or (2) the production of acid and a trace of gas, or (3) to full acid and gas production and retained this reaction until discarded, but they did not breed true, and if plated out, particularly before the broth was 10 days old, revealed only the colorless colony characteristic of the aberrant strain. In Table 1 are given the results in illustrative series for 2, 3, 7, and 10 day incubation intervals.

Having determined to our satisfaction that certain tubes in each series would in a few days give rise to a typical, though late, reaction and would yield two types of colonies on plating, we were interested in investigating the possibility that through selection one could derive lactose negative strains, very slow fermenters, cultures producing only acid, or cultures constantly producing only a trace of gas in addition to acid.

Regarding the first possibility it may be said that we have not yet encountered from the strains we have worked with a single lactose tube showing a reaction of "growth only" which did not at least progress to acid production if observed long enough. The data given below will show that at 10 days certain tubes are "growth only" but in every case acid, at least, was produced with a few more days' observation. We endeavored by selection to derive strains which would

(1) remain permanently lactose negative, or (2) ferment lactose very slowly. A series of sixty lactose tubes which had remained "growth only" for from 4 to 10 days was plated and from each plate 10 colonies were picked to lactose broth. At the end of 10 days' incubation, 8 tubes were "growth only," 184 were "acid only," 146 showed acid and a trace of gas, and 262 showed acid and full gas production. Each of the 8 "growth only" tubes eventually fermented lactose.

In our series a large number of tubes of lactose broth produced a reaction of acid only, and this reaction persisted for many of the tubes despite weeks of observation. Except for 2 tubes recorded by Robbins and Parr,<sup>4</sup> not one of these tubes bred true. Eighty-five tubes in which the age was from 4 to 25 days and the reaction "acid only" were plated on Endo's agar and from each plate 10 colonies were picked to lactose broth. After 10 days' incubation at 37° C. the results were: 1 tube "growth only," 208 tubes "acid only," 398 tubes "acid, with a trace of gas," and 243 tubes, "acid and normal gas production."

A similar experiment was carried out for 74 tubes in which the reaction was normal acid with subnormal gas production. After 10 days' incubation the 740 tubes fell into the following classification: 2 "growth only," 64 "acid only," 400 "acid with a trace of gas," and 274 "acid and normal gas production." It should be pointed out that

TABLE 2

*Distribution of Reactions After 10 Days' Incubation at 37° C. in "Selection" Series of Lactose Broth Tubes*

Strain Tested	Number	Percentage of Tubes Giving Reactions Noted			
		Growth	Acid	Acid, Trace Gas	Acid and Gas
Growth only	60	1.3	30.6	24.3	43.6
Acid only	85	0.11	24.4	46.8	28.6
Acid, trace gas	74	0.25	8.6	54.1	37.0

many of the tubes which at 10 days showed "acid and normal gas production," produced that reaction only after several days delay and would have been missed in routine standard methods analysis. The results from these experiments are summarized in Table 2.

From these experiments it is obvious that cultures derived from aberrant coliform bacteria (Group III) do not readily (if at all) give rise through processes of selection to strains other than the two already well known, *i.e.*, the prompt and typical lactose fermenter and the original aberrant, "mutabile," or "unstable variant." Parr and Robbins have obtained authentic anaerogenic ("acid only") strains from such sources, but under conditions which suggest "mutation," and such instances are rare.

#### DISCUSSION

Our findings do not particularly simplify the problems certain aberrant coliform bacteria offer sanitary bacteriologists. On the other hand, we believe that it is shown that certain of these "slow-fermenters" have fully as much sanitary significance as normal coliforms. If organisms which sanitary procedures will not reveal are truly fecal in nature it may be questioned whether our procedures are entirely adequate. Our safety has been assured by the fact that most significant pollutions are communal in nature and practically always include feces containing normal coliform bacteria. The occurrence of aberrant coliform bacteria is, however, by no means uncommon, even in the healthy, as has been pointed out repeatedly by many writers. We fully agree with certain writers that some of the aberrant coliform bacteria represent only harmless forms of the field and granary. We know that others derive from mammalian feces and often from individuals more or less ill. Can these two groups be differentiated?

We believe, further, that whenever

possible all cultures appearing to be aberrant in nature should be checked by the method of multiple subculture which we have described above. If most of the Group III aberrant coliform bacteria will break down as we have described, there is in multiple subculture a method of checking suspicious isolations which may be of value. Further experimentation designed to bring out differences between significant and non-significant aberrant coliform bacteria is highly desirable.

#### CONCLUSIONS

Data are presented on papillate aberrant coliform bacteria of the *Bacterium coli-mutabile* type showing that in multiple, serial subculture these strains exhibit a partial "mutational" activity in lactose broth. About one-fourth of the tubes inoculated show slightly delayed but otherwise normal lactose fermentation. The populations in such tubes are shown by plating to be of two kinds: the normal coliform, and the aberrant coliform, having similar reactions save for lactose fermentation. The balance of the tubes of lactose broth inoculated in any series progress slowly to the production of acid or of acid and variable amounts of gas, but such tubes do not breed true.

It has been impossible by ordinary methods of selection to isolate and preserve strains showing no fermentation of lactose, acid production only, or acid and subnormal gas production only.

It is believed that cultures showing aberrant reactions should be studied in multiple subculture if their nature is to be best understood.

The importance of distinguishing between significant and nonsignificant aberrant coliform bacteria is stressed.

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# Simultaneous Administration of Diphtheria Toxoid and Pertussis Vaccine in Young Children\*

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THE ability of the body to develop protective substances after two or more antigens are injected, either simultaneously or mixed in the same dose, opens a wide field in preventive medicine. Protection of children against diphtheria and tetanus by the administration of mixed diphtheria and tetanus toxoids has been demonstrated within recent years. Bordet,<sup>1</sup> Director of the Pasteur Institute in Brussels, reported in 1936 on the injection of infants and children against whooping cough and diphtheria by the use of a mixture of *Hemophilus pertussis* vaccine and diphtheria anatoxin (toxoid). Ramon, Director of the Pasteur Institute in Paris, and Debré, the pediatrician, collaborated with Bordet. Three hypodermic injections were given at 3 week intervals as Zoeller<sup>2</sup> had recommended for diphtheria immunization. The third dose was fortified by the addition of appreciably more pertussis organisms. Bordet concluded: "It seemed logical to attempt immunization against these two diseases at the same time, because it is at the same period of life when they are most likely to occur in severe form."

At the Evanston Health Department immunization clinic, a total of 1,586 Infant Welfare clinic children between the ages of 8 and 24 months were injected with *Hemophilus pertussis* vaccine prior to October, 1938. The pertussis vaccine † was injected at 3 week intervals after the 8th month of life, because it was found that complement-fixation tests, made two or three months after the final injection, showed a higher incidence of 3+ and 4+ reactions when this procedure was followed than when the injections were given at weekly intervals, or earlier than the 7th month of life. Likewise when the retest was performed a week after the final injection, a higher complement-fixation was found in cases where there had been a 3 week interval between injections than in those where there had been a weekly interval. The intermediate strength vaccine (15,000 million organisms per ml.) was preferred, because it was less voluminous than the original 10,000 million, and local reactions were less than with

\* Read before the Laboratory Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 17, 1941.

† Pertussis Vaccine Immunizing (Sauer), authorized by Northwestern University Medical School, is prepared in a biological laboratory, according to detailed specifications.<sup>4</sup> The vaccine is not washed, as it contains no animal protein. Each lot is examined and approved by the Whooping Cough Research Laboratory of Northwestern University Medical School before it is released.



the 20,000 million concentrations. Approximately 4 months after completion of the pertussis immunization, three diphtheria toxoid (plain) injections were given at 3 week intervals and, about 6 months later, smallpox vaccination was carried out. Pertussis vaccine was always given first because, as Hektoen and Lovett<sup>3</sup> pointed out: "Of all contagious diseases, whooping cough is the most likely to affect the youngest members of the family; and herein lies its chief danger. Whooping cough, like smallpox, diphtheria, and scarlet fever, may often be prevented if an ample dosage of potent whooping cough vaccine is injected into infants over 7 months of age, sufficiently long before exposure occurs."

#### DIPHTHERIA AND PERTUSSIS ANTIGENS, SIMULTANEOUS AND MIXED

Since 1938, a total of 464 Infant Welfare children were injected with the two antigens at the same time. To determine whether mixing diphtheria toxoid and pertussis vaccine might lessen or augment the antigenic value of either or of both components, two groups of children were injected. A group of 208 children were injected simultaneously with the 15,000 million per ml. vaccine (2, 2, and 3 ml.) and in the same arm with diphtheria toxoid (1, 1, and 1 ml.), at 3 week intervals. A group of 256 children were injected with the antigens mixed \* (15,000 million pertussis bacilli

in diphtheria toxoid). The mixed antigens were prepared so that each dose of 2, 2, and 3 ml. equalled that when the antigens were given simultaneously. Injections were given in alternate arms at 3 week intervals as customary, just beneath the skin,<sup>†</sup> to retard absorption, produce maximum response, and lessen systemic (febrile) reactions. Parents were informed that the injection might be followed by a local reaction and fever of short duration. They were cautioned not to apply any local treatment. Taking the temperature was discouraged. They were instructed to give 3 or 5 grains of aspirin during the night if the child became restless or feverish. No instance of local infection occurred. Practically the only interruption in the routine administration of the injections occurred in the children who contracted intercurrent diseases. Those who failed to complete the series of injections were in families who moved away.

Schick tests,<sup>‡</sup> complement-fixation tests, and determination of diphtheria antitoxin concentration of the serum were performed before and after completion of the injections. The retests were performed at various intervals after completion of the injections, to compare the effectiveness of the simultaneous and mixed methods of antigen administration, and to ascertain the best time for the follow-up complement-fixation test. Schick test readings were performed 72 hours after 0.1 ml. of Schick test material was injected intracutaneously in the flexor surface of the left forearm; retests were performed on the right forearm. Diphtheria antitoxin concentration determinations were per-

\* Through the cooperation of Drs. L. T. Clark and N. S. Ferry, of Parke, Davis and Company, the mixed antigens were prepared according to detailed specifications. The mixture contained 5 to 7 recently isolated, hemolytic cultures of *Hemophilus pertussis* bacilli, grown on Bordet-Gengou medium containing defibrinated human blood. The growth was scraped from the culture medium and suspended in 0.85 per cent salt solution containing Merthiolate 1:5,000. After refrigeration at 5° to 10° C. for several weeks, it was cultured for sterility and examined microscopically for absence of contaminants. Each lot was standardized to contain 30 billion *Hemophilus pertussis* per ml. An equal volume of Diphtheria Toxoid, Plain, was added to the suspension to make a final concentration of 15 billion *Hemophilus pertussis* and an equivalent of 0.5 ml.

of diphtheria toxoid in the mixed antigens. Preliminary series of mouse inoculations were conducted with increasing amounts of mixed antigen before any child was injected. Various lots of mixed antigens were used.

† Intradermal injection would produce a more severe local reaction; intramuscular injection accelerates absorption and is more likely to cause fever.

‡ The Schick test material was provided by the Illinois State Board of Health.

formed by Mr. Jones\* on 82 infants before and after completion of the injection of mixed antigens. All showed less than 0.002 unit of antitoxin per ml. of serum at the preliminary test. The antitoxin concentration exceeded 0.002 unit per ml. of serum in 89 per cent of the children when retested 3 to 6 months after the final injection. The highest incidence and degree of antibody response seemed to occur when the retests were performed 6 weeks after completion of the injections. Details of the technic for the pertussis complement-fixation test have appeared in the chapter "Pertussis" in Brennemann's *Practice of Pediatrics*.

the antigens simultaneously, and 168 had the mixed antigens; 183 had only the follow-up tests. Of the latter, 84 per cent showed positive complement-fixation reactions. All but one of the negatives became positive 3 weeks after receiving a "stimulating" dose of 2 ml. of plain 15,000 million pertussis vaccine, as first used by Wu and Chu.<sup>6</sup> The preliminary tests were discontinued on these 183 children because it had been found in our previous studies that practically every child had no antibodies for diphtheria as well as for pertussis before injections were given. The follow-up tests are now performed 6 weeks after completion of the injections. Any child

TABLE 1

*Preliminary and Follow-up Schick Tests and Pertussis Complement-Fixation Tests  
(Antigens injected at 3 week intervals)*

Number of Children		Schick Test	Pertussis Complement- Fixation Test
		Per cent Positive	Per cent Positive
113 (Antigens Simultaneous)	Before injection	96	6
	After injection	2	91*
168 (Antigens Mixed)	Before injection	93	4
	After injection	5	73*

\* All of the complement-fixation negative children (9 per cent and 27 per cent respectively) became 3+ or 4+ positive when retested 3 weeks after a "stimulating" dose (2 ml. of 15,000 million per ml.) of *Hemophilus pertussis* vaccine.

When it was found that serum antitoxin determinations coincided with the Schick test readings, blood serum titrations were discontinued, and the Schick test was used as the sole index of immunity to diphtheria. Of the 464 Infant Welfare children who had the two antigens at the same time, 281 were tested before and after the injection; 113 had

in either series whose pertussis complement-fixation follow-up test was either 1+ or 2+, was given the "stimulating" dose. Forty-four children who had shown good immunity response after injection of mixed antigens were retested 1 to 2 years later. Their Schick tests and pertussis complement-fixation tests still showed a high level of immunity; reversion had not occurred.

Table 1 is a summary of the preliminary and follow-up pertussis complement-fixation tests and Schick tests for diphtheria. The two series—simultane-

\* During the early part of the study the complement-fixation tests were performed by Frank G. Jones of The Lilly Research Laboratories; since May, 1940, by Eva Markley of the Whooping Cough Research Laboratory.

ous injection and mixed antigen—are compared. The pertussis antibody response in both series compared quite favorably with the response when months intervened between the plain pertussis vaccine injections and the diphtheria toxoid injections. The Schick test as an index of protection against diphtheria was equally good in both series. The diphtheria toxoid maintained its antigenicity when mixed with the pertussis vaccine. Synergistic action was not observed.

It is too soon for an adequate evaluation of clinical results. In several minor outbreaks of pertussis among noninjected Evanston children, a few of the injected children of both series were intimately exposed, but no injected child was known to have developed pertussis. From the above data it appears that older infants and young children can be protected against both pertussis and diphtheria by the administration of 3 doses of the mixed antigens at 3 week intervals. The number of injections for protection against these two diseases is thus cut in half.

#### SUMMARY

1. In 3 years, a total of 464 Infant Welfare children, 8 to 24 months of age, were injected against whooping cough and diphtheria at the

same time. In 208 of the children, the two antigens, pertussis vaccine (15,000 million bacilli per ml.) and diphtheria toxoid were injected simultaneously. In 256 children the two antigens were mixed.

2. Schick tests, and pertussis complement-fixation tests were performed before and after administration of the antigens in 113 children injected simultaneously and in 168 children injected with the mixed antigens.

#### CONCLUSION

Immunization responses (Schick tests and pertussis complement-fixation tests) after 3 doses of mixed antigens at 3 week intervals compared favorably with those obtained after separate injections of equivalent amounts of the antigens. This experience with mixed pertussis and diphtheria antigens should warrant further trial on a large scale in the immunization programs of health departments and private physicians.

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# Influence of Wetting Agents on Various Antiseptics\*

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IN the past few years, surface tension reducing agents, or so-called "wetting agents," have been put to use in various industries. They are being extensively used in the tanning, textile, paper, metal processing, paint, laundry, insecticide, lubricating, cosmetic, and rubber industries, etc. More recently the bacteriostatic and bactericidal effects of wetting agents alone and in conjunction with standard antiseptics have been investigated.

Scales and Kemp<sup>1</sup> demonstrated that synthetic organic detergents could be used for some sterilizing procedures in place of chlorine. They pointed out that wetting agents spread much more easily over a greasy surface and had the advantage of being noncorrosive to metals. Petroff and Schain<sup>2</sup> recommended the use of a wetting agent (Tergitol O8) as an aid in the digestion and concentration of tuberculous pathological material. The cleansing and sterilizing of ureteral catheters with a 12½ per cent solution of Tergitol O8 was suggested by Winer and LaCava.<sup>3</sup> They found that such a solution was powerful enough to kill the tubercle bacillus.

Miller and Baker<sup>4</sup> and Baker, Harrison, and Miller<sup>5</sup> studied the action of numerous synthetic detergents on the metabolism of bacteria by the manometric method. They concluded that all the cationic detergents studied were very effective inhibitors of bacterial metabo-

ism. Gram-positive and Gram-negative microorganisms were equally sensitive to the action of cationic detergents, but the anionic detergents selectively inhibited the metabolism of Gram-positive organisms only. Cationic detergents exhibited their maximum activity in the alkaline pH range and anionic in the acid range. Certain detergents were found to stimulate bacterial metabolism at concentrations lower than the inhibiting values.

Scales and Kemp's<sup>6</sup> results indicated that anionic detergents in solutions acidified to a pH of 4.0 were equally active against Gram-positive and Gram-negative organisms and that the germicidal properties of all wetting agents they studied were more pronounced when the pH values were in the lower acid range. They recommended the use of certain wetting agents in this category for the sterilization of milk cans, drinking glasses, and other utensils in public establishments.

Petroff and Schain<sup>7</sup> carried out phenol coefficient tests with a long list of wetting agents alone, and in conjunction with standard antiseptics such as phenol, chloramine T, azochloramid and merthiolate, among others, and found that these antiseptics killed in much higher dilutions when combined with dilutions of wetting agents as high as 1:5,000 and 1:10,000. In the treatment of empyemas they used dilutions of azochloramid 1:3,300 mixed with tergitol 1:2,000 for irrigations and found the results encouraging in the treatment of mixed

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TABLE 1  
Wetting Agents Studied

Type of Wetting Agent	Trade Name	Chemical Composition	Manufacturer
Anionic	Nacconol FSNO	Sodium alkyl aryl sulfonate	National Aniline and Chemical Co. Carbon and Carbide Corp. E. I. duPont de Nemours Co.
	Tergitol O8	Sodium alcohol sulfate	
	Duponol WA	Fatty alcohol sulfate	
Neutral	Triton NE Concentrate	Organic polyether alcohol	Röhm and Haas Co.
Cationic	Triton K-12	Cetyl dimethyl benzyl ammonium chloride	Röhm and Haas Co.
	Triton K-60	Lauryl dimethyl benzyl ammonium chloride	

infections of staphylococcus, streptococcus, and pyocyanus. Kintz<sup>8</sup> has employed azochloramid in combination with sodium tetradecyl sulfate and sulfanilamide, combined with the same wetting agent in the treatment of infected wounds of the soft tissues of the face, obtaining better results and speedier recoveries than he obtained

with other solutions which he investigated.

Ordal, Wilson, and Borg<sup>9</sup> investigated the effect of several types of soaps alone and in combination with wetting agent sodium lauryl sulfonate on the germicidal action of phenolic compounds. Their work was done in moderately alkaline solutions where the pH of the

TABLE 2  
Bactericidal Effect of Wetting Agents at Various Hydrogen Ion Concentrations  
*Staphylococcus aureus*—Temperature: 37° C.

Type of Wetting Agent	Name	Dilution	Hydrogen Ion Concentration					
			4.0		7.0		9.0	
			5'	10'	5'	10'	5'	10'
Anionic	Nacconol FSNO	{ 1:20	+	—	—	—	—	—
		{ 1:40	+	+	+	+	+	+
		{ 1:80	+	+	+	+	+	+
	Tergitol O8	{ 1:20	+	+	+	+	+	+
		{ 1:40	+	+	+	+	+	+
		{ 1:80	+	+	+	+	+	+
Duponol WA	{ 1:20	+	+	+	+	+	+	
	{ 1:40	+	+	+	+	+	+	
	{ 1:80	+	+	+	+	+	+	
Neutral	Triton NE Concentrate	{ 1:20	+	+	+	+	+	+
		{ 1:40	+	+	+	+	+	+
		{ 1:80	+	+	+	+	+	+
Cationic	Triton K-12	{ 1:1000	—	—	—	—	—	—
		{ 1:2000	—	—	—	—	—	—
		{ 1:4000	+	—	+	—	—	—
		{ 1:8000	—	+	+	—	+	+
		{ 1:16000	+	+	+	+	+	+
	Triton K-60	{ 1:160	—	—	—	—	—	—
		{ 1:320	—	—	—	—	—	—
		{ 1:640	—	—	—	—	—	—
		{ 1:1000	+	—	+	—	+	+
		{ 1:2000	+	+	+	+	+	+
		Phenol Control						
			5'	10'				
	1:70	—	—					
	1:80	+	—					
	1:90	+	+					

TABLE 3

*Bactericidal Effect of Wetting Agents at Various Hydrogen Ion Concentrations*  
*Eberthella typhosa*—Temperature: 20° C.

Type of Wetting Agent	Name	Dilution	Hydrogen Ion Concentration					
			4.0		7.0		9.0	
			5'	10'	5'	10'	5'	10'
Anionic	Nacconol FSNO	{ 1:20	+	+	+	+	+	+
		{ 1:40	+	+	+	+	+	+
		{ 1:80	+	+	+	+	+	+
	Tergitol OS	{ 1:20	+	+	+	+	+	+
		{ 1:40	+	+	+	+	+	+
		{ 1:80	+	+	+	+	+	+
Duponol WA	{ 1:20	+	+	+	+	+	+	
	{ 1:40	+	+	+	+	+	+	
	{ 1:80	+	+	+	+	+	+	
Neutral	Triton NE Concentrate	{ 1:20	+	+	+	+	+	+
		{ 1:40	+	+	+	+	+	+
		{ 1:80	+	+	+	+	+	+
Cationic	Triton K-12	{ 1:1000	—	—	—	—	—	—
		{ 1:2000	—	—	+	—	—	—
		{ 1:3000	—	—	+	+	+	—
		{ 1:4000	+	—	+	+	+	+
		{ 1:8000	+	+	+	+	+	+
	Triton K-60	{ 1:320	—	—	—	—	—	—
		{ 1:640	+	—	—	—	—	—
		{ 1:1000	+	+	+	+	+	+
		{ 1:2000	+	+	+	+	+	+
Phenol Control								
		5'	10'					
		1:80	—	—				
		1:90	+	—				
		1:100	+	+				

solution was rigidly controlled. They concluded that the addition of the wetting agent in general increased the germicidal activity of such phenolic solutions.

Gershenfeld and Witlin<sup>10</sup> have reported that the addition of 39 available marketable surface tension reducing chemicals commonly employed as wetting agents in concentrations of 0.1 per cent, 0.5 per cent, and 1.0 per cent respectively did not increase the bactericidal or bacteriostatic efficiencies of 16 phenolic, 10 mercurial, and 2 halogen compounds when no adjustments to specific hydrogen ion concentrations were made. On the other hand, when Gershenfeld and Perlstein<sup>11</sup> adjusted the pH of phenol, mercury bichloride, merthiolate, and hexylresorcinol to a pH

of 4.0 with the addition of a wetting agent, marked increases in bactericidal activity were obtained.

Gershenfeld and Milanick,<sup>12</sup> studying the bactericidal action of surface tension depressants alone, reached conclusions regarding the effect of pH similar to those expressed by Baker, Harrison, and Miller.<sup>5</sup>

#### EXPERIMENTAL PROCEDURES

The reports discussed above have used varied methods for demonstrating bactericidal effects of wetting agents. The purpose of this investigation was to study their effects by a standard procedure such as the phenol coefficient method. All experiments were carried out as described in *Circular 198* of the Food and Drug Administration. The

wetting agents studied are shown in Table 1. Tables 2 and 3 show the killing action of the wetting agents alone, as well as the effect of pH change. All pH adjustments were made with 0.1 normal HCl or 0.1 normal NaOH, values being determined with the Beckman pH meter. After adjustments of the wetting agent to the desired pH, further dilutions were made with water adjusted to the same pH.

Since Nacconol FSNO gave slightly better results than the other anionic wetting agents, it was chosen to represent the anionic detergents. Preliminary experiments with Nacconol had indicated that it caused very little change in

the pH of antiseptics to which it was added, whereas Tergitol O8 and Duponol WA did. Triton NE Concentrate was chosen since it was then the only neutral wetting agent available. Triton K-60 was studied further instead of Triton K-12; although the latter gave the better bactericidal results, discontinuance of commercial manufacture made Triton K-12, unavailable for continued study.

Phenol coefficients for *Staphylococcus aureus* at 37° C., obtained with and without the addition of wetting agents, are shown in Table 4. Those obtained for *Eberthella typhosa* at 20° C. are shown in Table 5.

TABLE 4

*Phenol Coefficients of Antiseptics with and without Wetting Agents*  
*Test Organism: Staphylococcus aureus—Temperature: 37° C.*

<i>Antiseptic</i>	<i>Wetting Agent 1:1000 Dilution</i>	<i>pH</i>	<i>Highest Dilution Killing in 10' But Not in 5'</i>	<i>Phenol Control</i>	<i>Phenol Coefficient</i>
Mercuric Chloride †	O	4.0	1:3500	1:75	46.0
	Nacconol FSNO	4.1	1:11000	1:75	146.0
	Triton NE Concentrate	3.9	1:15000	1:75	203.0
Mercury Oxycyanide †	O	5.8	1:1000	1:80	12.5
	Nacconol FSNO	6.32	1:9000	1:80	112.5
	Triton NE Concentrate	5.8	1:2000	1:80	25.0
	Triton K-60	5.9	1:12000	1:80	150.0
Phenol C.P.	O	7.11	1:80	1:80	1.0
	Nacconol FSNO	7.22	1:100	1:80	1.25
	Triton NE Concentrate	PRECIPITATES			
	Triton K-60	6.0	1:140	1:80	1.75
Cresol Compound U.S.P.	O	8.18	1:225	1:80	2.8
	Nacconol FSNO	8.2	1:300	1:80	3.75
	Triton NE Concentrate	PRECIPITATES			
	Triton K-60	7.8	1:250	1:80	3.1
Chloramine T, U.S.P.	O	6.22	1:1000	1:70	14.3
	Nacconol FSNO	6.2	1:3000	1:70	42.8
	Triton NE Concentrate	5.9	1:2250	1:70	32.1
	Triton K-60	6.65	1:3500	1:70	50.0
Tincture of Iodine U.S.P.	O	4.6	1:525	1:80	6.5
	Nacconol FSNO	4.69	1:633	1:80	7.9
	Triton NE Concentrate	PRECIPITATES			
	Triton K-60	PRECIPITATES			
Potassium Permanganate	O	8.7*	1:800	1:80	10.0
	Nacconol FSNO	9.1	1:1600	1:80	20.0
	Triton NE Concentrate	8.5	1:1100	1:80	13.75
	Triton K-60	PRECIPITATES			
Argyrol	O	9.0	1:50	1:80	0.55
	Nacconol FSNO	8.5	1:115	1:80	1.4
	Triton NE Concentrate	PRECIPITATES			
	Triton K-60	PRECIPITATES			

\* pH adjusted from 7.1

† Dilution results indicate findings from the resubcultures.

TABLE 5

*Phenol Coefficients of Antiseptics with and without Wetting Agents*  
*Test Organism: Eberthella typhosa—Temperature: 20° C.*

Antiseptic	Wetting Agent 1:1000 Dilution	pH	Highest Dilution Killing in 10' But Not in 5'	Phenol Control	Phenol Coefficient
Mercuric Chloride †	O	4.0	1:27000	1:90	309.0
	Nacconol FSNO	4.1	1:35000	1:90	386.0
	Triton NE Concentrate	3.9	1:33000	1:90	366.0
Mercury Oxycyanide †	O	5.8	1:12000	1:90	133.0
	Nacconol FSNO	6.2	1:16000	1:90	155.0
	Triton NE Concentrate	5.8	1:16000	1:90	155.0
Phenol C.P.	O	7.11	1:90	1:90	1.0
	Nacconol FSNO	7.2	1:125	1:90	1.37
	Duonol WA	7.28	1:150	1:90	1.66
	Triton NE Concentrate	PRECIPITATES			
	Triton K-60	7.0	1:100	1:90	1.1
Cresol Compound U.S.P.	O	8.18	1:450	1:90	5.0
	Nacconol FSNO	8.2	1:450	1:90	5.0
	Triton NE Concentrate	PRECIPITATES			
	Triton K-60	7.8	1:450	1:90	5.0
Chloramine T	O	6.42	1:2000	1:90	22.0
	Nacconol FSNO	6.48	1:2750	1:90	30.5
	Triton NE Concentrate	6.64	1:2500	1:90	27.7
	Triton K-60	6.65	1:2000	1:90	22.0
Potassium Permanganate	O	8.5*	1:2400	1:90	26.6
	Nacconol FSNO	9.0	1:3600	1:90	40.0
	Triton NE Concentrate	8.7	1:3000	1:90	33.3
	Triton K-60	PRECIPITATES			

\* pH adjusted from 7.1.

† Dilution results indicate findings from the resubcultures.

#### DISCUSSION

Although the testing of antiseptics by the phenol coefficient method is not an ideal procedure, it nevertheless serves as a standard by which bactericidal activity may be compared. We found, as has been pointed out by several investigators,<sup>1,5</sup> that cationic detergents as exemplified by Triton K-60 are more active bactericidal agents than anionic wetting agents. No previous work with a neutral wetting agent such as Triton NE has come to our attention. From the standpoint of compatibility with standard antiseptics, the anionic detergents as represented by Nacconol, were found to be more generally useful.

While pH plays a definite rôle in activity of antiseptics, as has been shown by many workers, adjustment of pH is often difficult, impossible, or impractical. The choice of a wetting agent

to be added to any given antiseptic should be determined on the basis of practicability and compatibility. In our experience no single wetting agent could be depended upon to enhance the bactericidal activity of all types of antiseptics.

The ideal antiseptic is still to be found, but it is believed that these surface tension depressants offer great possibilities for increasing the activity of existing bactericidal agents.

#### CONCLUSIONS

1. The addition in dilutions of 1:1,000 of surface tension reducing substances, whether cationic, anionic, or neutral, enhance the bactericidal activity of mercury bichloride, mercury oxycyanide, chloramine T, argyrol, and potassium permanganate.

2. Little or no increase in bactericidal activity was noted when these same substances were added to phenol, cresol, or tincture of iodine.



3. No single wetting agent was equally effective in increasing bactericidal activity of mercurials, halogens, phenolic, silver protein, and oxidizing compounds.

4. Compatibility of the wetting agent and the antiseptic is an important consideration.

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## Conservation of Man Power

A 3 DAY conference on the conservation of man power in war industries will be held in Washington, April 9-11, under the auspices of the U. S. Public Health Service.

Governmental industrial hygienists from the National Institute of Health and 36 states will meet in joint session with the Subcommittee on Industrial Health and Medicine of the Health and Medical Committee, Office of Defense Health and Welfare Services.

"The health problems of a vastly increased labor force in the war industries demand the best efforts of government, management, labor, and medicine, in order to conserve the energy and efficiency of every worker," Dr. Parran said in announcing the conference.

Even in normal times, 400,000,000 man-days are lost annually in industry because of sickness and accidents. A large part of this wastage can be pre-

vented. Representatives of the medical profession, governmental industrial hygiene services, management, and labor will participate in the discussion of ways and means to reduce industrial disability.

Federal Security Administrator Paul V. McNutt, Channing R. Dooley, Director of the Training within Industry Branch, War Production Board; Dr. Clarence V. Selby, Medical Director of the General Motors Corporation; Dr. Orlen B. Johnson of the American Medical Association's Council on Industrial Medicine; and Dr. James G. Townsend, Chief of the Division of Industrial Hygiene, National Institute of Health, will be among the principal speakers.

The conference, which will be opened by Surgeon General Parran, will meet in the auditorium of the Social Security Building, 4th and Independence Avenue, S. W.

# Workers' Health Education\*

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A SPRAY-painter in his middle 40's recently expounded during an entire lunch period on his hobby—stamp collecting. He was quite at home in the shop talk of the ardent philatelist. His own collection had been shown at an exhibition of rare items from the conquered nations. He said he had begun to collect stamps in grade school. An interested librarian selected books for him. He kept at it until he "knew all the ropes" about selecting and mounting stamps. Later he joined a club and "got wise" about trading and building a collection.

That day, a safety engineer was making an air determination at this man's station where a toxic fume exposure was suspected. When asked what the engineer was doing, the worker replied—with as much conviction as he discussed philately—"You see, lady, we need plenty of salt to keep healthy. He is trying to find out if there is enough salt in the air. If there isn't we can take salt tablets."

This worker's 35 years of experience in stamp collecting will not save him or his employer one hour of time lost because of sickness. Given a similar background of knowledge and skill in ways to protect his health, he and thousands like him can make a significant contribution to the reduction of disability in industry.

All of us need much information and

practice before we become proficient in our management of any department of living. So the worker needs instruction in health matters, and he needs the opportunity to practise what he knows if he is to manage his health problems with good judgment. This indeed is the objective of workers' health education—to provide information and experiences which make for better health and better coöperation with the industrial hygiene program. Without the worker's coöperation, it seems clear that efforts on the part of industry and public health workers will not function to the maximum benefit. The slowness with which instruction of workers has developed as an industrial hygiene activity is only part and parcel with the general lag in health education for adults.

The aging of the population in the United States has increased the public importance of young adults and older people. It has brought about fundamental changes in education. It has played a little recognized part in the creation of a surplus labor supply. It has focused public health attention on the chronic degenerative diseases. Nevertheless, the major share of health education effort is still directed toward the protection of infants and children under high school age. Health education of adults by responsible agencies has been directed principally to informing them about community sanitation, a few specific diseases (tuberculosis, venereal diseases and cancer), maternal care, and parents' responsibility for children's

\* Read before the Industrial Hygiene Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 17, 1941.

health. There has been very little effort to help adults deal effectively with situations directly affecting their personal health.

I need only mention here that these general problems of adult health are the principal causes of absenteeism, loss of income, and premature dependency among industrial workers. In addition, workers have the special problems incident to their occupations.

Labor and industry, public health workers and educators have all been slow to recognize the necessity for incorporating workers' health education into their programs. A few large employers have blazed the trail by integrating educational activities with their medical services. Insurance companies too have pioneered in the provision of educational materials. But we may look in vain to the literature of labor and public health for more than passing reference to the need for health instruction of workers. When we recall that not more than one-seventh of the workers are employed in industries providing full-time medical services, the opportunity of the industrial population to secure health education seems very limited.

In the meantime, advertisers have fully exploited the adult's need for health information. Reading a "patent medicine" advertisement and taking a worthless nostrum are assuredly not the instruction and experience we want in workers' health education. But it is "education" in the sense of learning and doing. And this will be the kind of health education workers get unless something better is offered.

#### HEALTH EDUCATION MATERIALS

This year, the U. S. Public Health Service decided to enter the field by making available educational materials for use in workers' health education activities. The provision of materials is only a part of the large job that waits

to be done. But, as in any educational program, the first requirement is for adequate tools in the various media of mass communication.

The program has been developed by the Division of Industrial Hygiene and the Division of Sanitary Reports and Statistics. The production schedule includes some twenty illustrated leaflets, a series of color posters, photographic exhibits, electrically transcribed radio programs, and a motion picture. The leaflet series was planned several months in advance of the posters and the radio program, hence production of the printed materials is much further along. To date, 4 leaflets have been released by the Government Printing Office, and we are momentarily expecting delivery of a fifth.

It was planned to cover in the leaflet series ten important non-industrial health problems and ten situations directly related to the job. The first group—the general health group—includes: influenza, appendicitis, stomach disorders, pneumonia, arthritis and rheumatism, nutrition, the health of women workers, mental health, heart disease, and kidney disease. The occupational group includes: carbon monoxide, benzol, the preemployment medical examination, dermatoses, changes in temperature and high humidity, infection of minor wounds, dust diseases, good housekeeping on the job, lead poisoning, and hydrogen sulfide.

The selection of these topics may be of interest. It offers an example of coöperation between two divisions of a health agency in the development of educational activities. Since time and funds were limited, it was necessary to select for first attention subjects that (a) affect large numbers of workers in the majority of industries, and (b) have not already been adequately covered in the existing health education literature.

The Division of Industrial Hygiene had precise information on the principal

causes of non-industrial sickness. Recent surveys also indicated the numbers of workers employed in occupations potentially hazardous. The work of the division in the promotion of industrial hygiene services further gave information on particular needs of the field.

The Division of Sanitary Reports and Statistics had extensive information on existing health education materials and their sources of distribution. Hence, it was possible to balance the problems needing attention against the availability of suitable materials and proceed without duplicating educational effort.

In the selection of occupational diseases and health practices on the job, we had an unlimited choice. Among 2,500 pamphlets produced by 115 agencies, only 36 publications on industrial hygiene were found. At best, only 20 of these were written to inform the worker on potential hazards and the means to avoid them.

The excellent educational materials of the National Safety Council covered only first aid procedures and personal hygiene. Moreover, distribution of these materials to workers was dependent upon their purchase by employers.

The Bureau of Labor Standards, U. S. Department of Labor, had produced a series of leaflets presenting the cause, symptoms, and methods of prevention of certain industrial poisons. These publications are not illustrated, nor have they much to command interest on the part of the individual worker. As in most health education materials there is little in the series to explain the "why" of the procedures recommended or the relation between cause and effect.

There appears to be some apprehension in certain industrial quarters lest information on occupational diseases "scare the workers" into quitting their jobs or claiming compensation for imagined sickness. Time does not permit debating this point, but I should like to state the position of the Public

Health Service. In many cases, medical and engineering control of hazardous exposures depends heavily upon the alertness of the worker and his compliance with regulations. It is too late to develop this awareness and coöperation *after* an exposure produces cases. Information should be looked upon as a *preventive* measure.

In the preparation of our leaflets on occupational exposures, we have taken the preventive approach. Every effort has been made to present the positive side of the story, at the same time warning against the potential consequences of the hazard.

Our guide in preparing the Workers' Health Series has been the requirements laid down by James Harvey Robinson 15 years ago in his book *The Humanizing of Knowledge*. He holds that writing for the general reader must do three things: (1) enlist the reader's attention; (2) present the facts and information in terms and in an order that will be understood by him and will fit into his way of looking at things; and (3) it should wisely suggest the significance of the information in relation to the reader's thought and behavior, and in his relationships with others.

The non-industrial subjects to be covered in the Workers' Health Series have been mentioned. Let us now turn to the existing health education materials and see whether these subjects have been adequately covered and are generally available to our rapidly growing employed population.

Influenza and pneumonia stand high on the list of disabling illnesses among industrial workers. In the group of 2,500 pamphlets previously mentioned, only 6 were devoted to influenza. These were produced by state departments of health, and hence their availability was limited. Moreover, the publications were virtually useless for workers' education since they dealt with public health control measures or were reprints of

statements which had been issued 23 years ago.

The 7 pamphlets on pneumonia which had been prepared for the general public were produced by five state health departments and two insurance companies. However, all of these had been published before the introduction of the sulfonamide drugs.

Stomach disorders, exclusive of cancer, are the second most frequent cause of disability among workers. In the entire group of 2,500 health pamphlets there was not one on this subject. The same is true of the health problems of women workers. Gafafer reports the rate of disabling sickness of females as 63 per cent in excess of that among males. The only significant educational materials for women found in our pamphlet collection were on maternal care. In this field, official health agencies and private organizations alike have done an excellent job. There were one or two items on "reducing" and "posture." But there was nothing designed to shake the curious apathy of women to constructive attention to their health. The extensive advertising of remedies for the "relief" of menstrual disorders and of other diseases which score high disability and death rates among women suggests that this is a fertile field for sound health education.

Every responsible group has put off facing the difficulty of teaching adults about their mental health problems. But face it now we must. Industry and medicine know that mental disorders cripple production. This is so whether the disorder be frankly psychotic or mild or even buried beneath physical ailments or problems in personnel management.

Virtually all of mental hygiene educational effort to date has been directed toward the behavior of children. For example, only 22 pamphlets in 2,500 were on mental hygiene; of these, 2 were on mental problems of old age. Only

one attempted to cover the general subject of mental disease and the causative factors. It is clear that educational materials on mental problems for industrial workers will be difficult to prepare. We shall be breaking ground, and shall need a great deal of help. Anything prepared at this time will have to be regarded as an experiment. One of the pamphlets in our collection suggests a fruitful line of approach. This is *Making the Most of Maturity*, publication Company. No attempt has been made to teach mental hygiene concepts as such; but through stimulating aging people to take up a hobby, practical application of mental hygiene concepts to daily life are made in such ways as to arouse the interest of the reader and help him relate the information to his own living. It may be that through such an indirect approach we can gradually make a dent in popular resistance to any reference to mental disease and psychiatry.

And so it goes—nutrition, arthritis and rheumatism, heart diseases, appendicitis, kidney diseases. Few, if any, educational materials suited to the abilities and interests of the average adult. How to avoid sickness and how to meet it if it strikes, how to live well and happily—these are serious questions for the millions who come out of elementary school and high school and go to work with little knowledge or skill in health protection. Their usual informational background is advertising copy plus the fatuous theory that if you obey the rules of personal hygiene and live rightly, you will come unscathed to a ripe old age and die with your boots on.

In workers' health education—which is adult health education—we must build a new background, not only to promote health but also to make sure that when sickness strikes, the individual will reach for a doctor and not for a bottle of little pills.

#### DISTRIBUTION OF EDUCATIONAL MATERIALS

The provision of materials is of no account unless they are placed in the hands of the individuals for whom they were prepared. The Public Health Service has developed the workers' health education program as a part of its coöperative industrial hygiene activity with states and industries. Hence, ultimate responsibility for placing the materials in the hands of workers lies outside the federal agency.

Fifty thousand copies of each leaflet are purchased by the Public Health Service from the Government Printing Office. This purchase includes the initial cost of production. Our distribution plan is to send 1,000 copies to each state and local industrial hygiene unit free of charge. At the present time, the number of such units absorbs 41,000 of our free copies. In addition, 100 copies are sent to state departments of health having no organized industrial hygiene service. Sample copies are sent to a list of interested organizations, including industries, other federal departments, labor unions, and voluntary health agencies.

An effective distribution program has not yet been developed. One state distributed all of its copies to the labor unions, and thus missed the opportunity of securing substantial distribution through many interested plants. Another state distributed its copies to industry only, and thus missed recruiting the support of labor and the value of distribution through the auxiliaries and welfare services of unions.

Vermont, with a relatively small working population, has devised an interesting way of providing health information to workers and of stimulating educational activity. With the coöperation of industry and labor, "health clubs" are being formed by the workers in many plants. The State Department of Health provides each worker who joins a club

with a membership card and button, and also agrees to supply educational materials on any subjects interesting the individual member or the group. Thus, there is an opportunity not only to "sell" industrial hygiene but other public health activities.

Sample copies of the posters now in production will be circulated, and the motion picture and the electrically transcribed radio dramas will be available for loan without charge (except transportation) to interested groups.

The workers' education program of the Canadian Department of Pensions and National Health got started a little in advance of the Public Health Service program. The Canadian Division of Industrial Hygiene is distributing leaflets and posters on occupational diseases. They have not yet attacked non-industrial disability. The leaflets are very similar to the ones produced by the Bureau of Labor Standards; they have the usual drabness of governmental publications, and use technical terms freely with the result that the material, on the whole, is more difficult for the worker to read and interpret than our American leaflets.

Nevertheless, the Canadian program has reached the majority of Canadian workers through a well planned distribution program. The materials are distributed free of cost to all. Immediately upon publication, one or two copies are sent to all industries in the Dominion where the material—benzol, TNT, etc.—discussed in the leaflet is used in manufacture. A form letter inviting the plants to order additional free supplies for distribution to each of their employees accompanies the leaflet. Dr. Kingsley Kay, who has been responsible for the program, reports that this method has met with only a moderate response, even though the materials were free.

Greater success was obtained by publicizing the educational program. The

leaflets were announced in the newspapers, trade magazines, and professional journals. The trade journals and newspapers eagerly accepted the information and urged workers to write for copies. As a result, thousands of requests were received from individual workers. These requests were supplied directly by the Division of Industrial Hygiene.

It is the policy of the Public Health Service to encourage individuals to seek information from their state or local services. Hence, no effort is made to stimulate individual requests to the Service. However, state and local industrial hygiene services may find some of the Canadian methods useful.

The cost of production and the number of workers to be reached are so much greater in the United States than in Canada that no one agency can be expected to bear the total cost of distribution. The Government Printing Office, therefore, offers for sale at quantity prices large supplies of the Workers' Health Series at the time the free supply is released.

To date, 153,043 of the first three Workers' Health Series leaflets have been sold by the Government Printing Office. The most popular of the first three has been *Leonard's Appendix and How It Burst*. Our free supply has been exhausted for some months and 69,774 copies have been sold. The leaflet on carbon monoxide, *KO by CO gas*, was released in July and 47,300 copies have already been sold. The first in the series, *But flu is tougher*, has sold fewer, 35,923 copies, but this is believed to be largely due to the fact that the "flu" season was almost over by the time the leaflet was released.

The fourth, *Clara gives Benzol the run around*, just came off the press this

week. The fifth, on stomach disorders, *Trouble in the Midriff*, is promised before the end of the month.

The channels for health education of the worker are manifold. It is hoped that all interested organizations and professional people will join with us in exploring and promoting every opportunity. Industrial hygiene services are offered so many educational opportunities in their relations with workers that it is hard to know where and how to begin. Yet we must admit that among millions of workers, opportunities are being missed. Authorities in the field have told us repeatedly how beneficial the services of the industrial physician have been in securing the coöperation and friendly response of workers. The same opportunities for health education are open to nurses in industry, engineers, chemists, and industrial hygienists. It is not possible to secure the desired response from the worker every time an educational opportunity is offered. Education in any field requires patience and insight. It requires sympathetic understanding of the people we wish to influence. There is no place for cynicism in workers' health education. To be sure, we shall repeatedly meet with discouragement; we shall meet, in many cases, provoking resistance to our efforts, but we must remember that much of our difficulty may be chalked up to past neglect.

Our country is founded on faith in the integrity of the individual, in his ability to learn through the free communication of ideas. This belief has not failed us in the past. It will not fail us in our efforts to improve the health of workers if we accept the challenge along with the promise of thereby being able to render fuller and more effective service.

# Use and Abuse of *Staphylococcus aureus* as a Test Organism\*

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THE use of *Staphylococcus aureus* as a test organism dates from the earliest history of germicidal testing, when Koch, Fischer, and Esmarch dried this organism on silk threads and Sternberg initiated the drop method of test. It is the most generally utilized micro-organism for antiseptic tests, and at present the only one with a standardized resistance suitable for this purpose. Apparently use by the U. S. Department of Agriculture of *Staphylococcus aureus* as an organism, for regulatory work in testing antiseptics and disinfectants not only stimulated general activity in the field of antiseptic testing, but too frequently, and quite unfortunately, led to the conclusion that the procedures described in *Circular 198*<sup>1</sup> are the only methods necessary for gauging the value of antiseptic substances. This is certainly far from the actual case. Used in these routine methods for comparing antiseptics and as a means of obtaining standardized measurements of relative germicidal or inhibitory qualities of products under certain conditions, *Staphylococcus aureus* of the prescribed resistance has proved itself very useful. However, no single standardized test is sufficient for ascertaining the merits possessed by a substance when used as an antiseptic under practical conditions of use. It was not anticipated that the laboratory tests set forth in *Circular 198*

would be utilized as the sole criterion of antiseptic efficacy. As a matter of fact, such tests are of value in demonstrating the worthlessness of a preparation, but fail to inform us of the effectiveness of an antiseptic under the modified conditions of use on or in the human body.

Although a strain of *Staphylococcus aureus* employed for testing purposes may be shown to possess definite resistance to germicidal action, such a fact conveys but little information concerning its value as a test organism for measuring the inhibitory or growth-preventing properties of a substance. Marshall<sup>2</sup> has stated that germicidal and inhibitory action differ only in degree. From a practical point of view the two qualities are quite distinct. The capacity to resist exposure to destructive agents for only short periods of time and the ability to proliferate under continuous adverse conditions are separate characteristics.

In spite of its well recognized resistance to germicidal agents, *Staphylococcus aureus* is well known as being more fastidious in its growth requirements than many other organisms of common occurrence. Consequently, its multiplication on laboratory media is more easily inhibited. In making tests with the agar plate or agar cup plate method, many substances at concentrations which have no effect upon the growth of an organism, such as *Escherichia coli*, produce definite zones of inhibition when *Staphylococcus aureus* is employed as the test

\* Read before the Laboratory Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 14, 1941.



organism. Indeed, because of the sensitivity of *Staphylococcus aureus* to mercury and silver, this organism with the agar plate technic can be utilized to detect minute concentrations of such heavy metals when combination with other materials makes their detection by chemical means very difficult. To credit inhibitory antiseptic value to preparations, or to ascribe value to so-called antiseptic flooring or sanitized materials, as has been done, on the basis of tests performed with *Staphylococcus aureus* as the only test organism, is unwarranted.

Although *Staphylococcus aureus* is relatively resistant among vegetative microorganisms, preparations found to be capable of killing it by the F. D. A. methods actually have not been subjected to exacting tests, nor have they demonstrated their capacity to kill organisms likely to be encountered under the various practical conditions of use. In utilizing the phagocytic ability of leucocytes against artificially opsonized cells of *Staphylococcus aureus* of standard resistance to determine the relative toxicity of antiseptic substances, Welch<sup>3</sup> used whole blood as a constituent of the test. In determining toxicity indices, based upon toxicity compared with germicidal effectiveness under similar conditions, he found that concentrations of many products capable of killing *Staphylococcus aureus* in 5 minutes by the F. D. A. method were not germicidal in the presence of the prescribed amount of blood in 30 minutes. Consequently blood diluted with 3 parts physiological saline is now employed in that portion of the test which measures relative germicidal activity.

It has been accepted throughout the disinfectant industry that products intended for general disinfection should be recommended at dilutions equivalent to 20 times their phenol coefficient, i.e., at dilutions 5 times more concentrated than the dilution found necessary to

kill *Eberthella typhosa* of standardized resistance in 10 minutes. This practice is based not only on the fact that *Eberthella typhosa* lacks a high resistance, but also upon the recognition that those organisms which are the object of disinfection under practical conditions may be more difficult to kill than those grown in the laboratory. No such "margin of safety" is employed for assuring germicidal action in the case of recommended dilutions of antiseptics. To be sure, so inflexible and arbitrary a means of assuring positive results is hardly feasible in the case of antiseptics, where toxicity and the nature of the sites of possible application must be considered. However, it would appear that tests utilizing body fluids such as saliva, sera, and blood should certainly be employed in determining the efficiency of the recommended dilutions before antiseptics are offered for general use.

Another field in which the use of *Staphylococcus aureus* of standardized resistance is abused is in its utilization for evaluating germicidal efficiency of those preparations recommended for the disinfection, in contrast to the sterilization of instruments, including surgical, veterinary, and dental appliances. Here again the concentrations recommended for use are ordinarily based upon the ability to kill the test organism without the provisions of a "margin of safety." Such a practice is essentially fallacious and fraught with hazard in its possible consequences. The sole purpose of testing such preparations should be an assured determination of their ability to kill all vegetative microorganisms. This cannot be done with cultures of *Staphylococcus aureus* conforming to present accepted standards of resistance. The present standard of resistance rests upon an empirical and arbitrarily selected basis and is far from the highest resistance which *Staphylococcus aureus* may possess.

Between 1918 and 1922 Shippen<sup>4</sup>

found that several strains of *Staphylococcus aureus*, when grown in media used for culturing *Eberthella typhosa* for phenol coefficient determinations, withstood the germicidal action of a 1:60 solution of phenol for 5 minutes. Reddish<sup>5</sup> later established that a number of other strains possessed this same resistance. Gradually this resistance became accepted as standard for *Staphylococcus aureus* cultured and tested according to the prescribed conditions and has persisted to the present. This resistance quite generally exceeds that of other organisms grown under similar conditions but it is inferior to that shown by *Staphylococcus aureus* grown under conditions which are only slightly different.

The strain of *Staphylococcus aureus* designated as 209 has been in use for germicidal testing since 1922 and has been widely distributed for that purpose. In our own laboratory this organism usually meets the specified resistance when cultured according to the directions set forth in the U. S. Department of Agriculture Circular 198, which provide for culturing for 24 hours from a 4 mm. loopful of inoculum of a broth culture in 10 ml. of medium contained in a 20 by 150 mm. test tube. The medium consists of 0.5 per cent beef extract, 1.0 per cent peptone (Armour's for disinfectant testing), and 0.5 per cent sodium chloride, in water, adjusted to pH 6.8. We have found that the resistance of this organism can be increased by decreasing the amount of beef extract, by increasing the time of the culture period, and by increasing the diameter of the vessel in which the organism is cultured, that is by increasing the surface ratio of the medium. Our studies show that there is a relationship between the amount of beef extract and the resistance of the test organism. Between the concentrations of 1.0 and 0.1 per cent of beef extract the average survival time of a 24 hour

broth culture increases from about  $3\frac{1}{2}$  minutes to approximately 7 minutes in a 1:60 dilution of phenol at 20° C. If the resistance of cultures of *Staphylococcus aureus* grown in 1.0, 0.5, 0.3, and 0.1 per cent beef extract broth is graphically represented by plotting resistance against concentration of beef extract a straight line results, the lower concentrations of the extract producing the more resistant cultures. With no beef extract in the culture medium, the average resistance of a number of cultures is less than that of those grown in a medium containing 0.1 per cent beef extract; however, some of these in broth containing only peptone will survive longer than any grown in broth containing beef extract. This anomaly is apparently due to the less favorable start afforded small inocula in the absence of beef extract, especially in old or well aerated media, where growth after 24 hours has reached a less advanced stage. It might be pointed out that increasing amounts of beef extract increase the population of the culture.

The increase in resistance obtained by incubating longer than 24 hours is unequal for cultures grown in different media. The resistance of cultures grown in peptone media containing 1.0 per cent beef extract will increase little if at all in 3 to 4 days' incubation at 37° C., while those grown in media containing peptone only, resist 1:60 phenol 3 times longer after a 3 day incubation period than after a 24 hour incubation period.

By using containers of a diameter larger than the 20 mm. tubes suggested in Circular 198 for carrying the usual 10 ml. volume of medium, an increase in resistance can be obtained for cultures grown in various types of media used. Conversely, if tubes of only 15 mm. diameter are employed for carrying this amount of medium, even those cultures in broth containing an optimal amount of beef extract are likely to fail to attain the standard resistance. At the

same time it must be considered that small inocula in broth containing no extract are increasingly liable to a tardy initiation of growth in large containers. We have found that thiamin chloride in approximately 0.5 to 1.0 gamma per ml. amounts is helpful in initiating growth in such circumstances with a consequent increase in the resistance of the culture. Cultures grown under such conditions retain their superior resistance throughout the cultivation period. In culturing the organism in 150 or 200 ml. Erlenmeyer flasks where 10 ml. of broth forms a relatively thin and well aerated layer, it is advantageous to use a preliminary culture period of 6 to 8 hours in the test tube before transferring the inoculated medium to the flask.

With the modifications noted above which tend to increase resistance, we have very frequently produced cultures of *Staphylococcus aureus* surviving a 1:60 dilution of phenol, i.e., a 1.66 per cent solution, for 1 hour and at times for 1½ hours in contrast to the prescribed 5 minute survival period.\* Cultures surviving this dilution for a period of 1 hour commonly survive a 2 per cent solution of phenol for 20 minutes.

We have encountered a number of preparations offered for the disinfection of instruments which are not capable of killing, in the recommended time periods, cultures of *Staphylococcus aureus* moderately more resistant than the standard.

It is apparent that more attention should be given to the standards of resistance for *Staphylococcus aureus* used as a test organism as well as to the interpretations based upon the results of the tests. Especially is this important in the testing of preparations for the disinfection of surgical instruments where the use of a test organism with high resistance is essential.

Again proper appraisal of an antiseptic may call for information not obtainable in the performance of a single *in vitro* test using as a test organism a single strain of one species of staphylococci. Obviously neither antiseptics nor disinfectants are used under such restricted conditions, nor are they recommended as efficacious against *Staphylococcus aureus* alone. The peculiar fitness of *Staphylococcus aureus* as a test organism for determining the germicidal power is readily conceded; and if circumstances arise to restrict the selection of test organisms to a single strain, it is also conceded that *Staphylococcus aureus* is undoubtedly best suited for the purpose. Certainly if a preparation fails utterly to destroy or inhibit the growth of *Staphylococcus aureus* under the conditions of the tests described in U. S. Department of Agriculture Circular 198, no merit whatsoever may be ascribed to that preparation. To this extent a single laboratory test utilizing *Staphylococcus aureus* may contribute all that need be known regarding such a substance.

On the other hand, there are numerous bacterial species much less readily inhibited in their growth by antiseptics than are the staphylococci, and among these organisms which more stubbornly grow in the presence of staphylococcus-inhibiting substances are species of real significance in the evaluation of the worth of an antiseptic. Consequently, if there is to be satisfactory evaluation of an antiseptic in terms of what might be expected of it under practical conditions of use, it will be necessary not only to take precautions to use a strain of *Staphylococcus aureus* of proper resistance and to follow meticulously certain prescribed manipulations, but to augment such procedures by the use of other test organisms and to adopt procedures designed to throw additional light on the value of the preparation. Accordingly, it is perhaps timely to

\* Different lots of the prescribed peptone have had varied effects on the production of cultures with relatively high resistance. The lot available at present is superior for this purpose to the preceding lot.

suggest a fallacy in the belief that proof of the ability of a compound to destroy or inhibit the growth of *Staphylococcus aureus* under the conditions of one *in vitro* test suffices to appraise the efficiency of that compound. With all its merits as a test organism, *Staphylococcus aureus* cannot serve as such an elastic measure.

#### SUMMARY

The comparative usefulness of *Staphylococcus aureus* as a test organism in methods of testing disinfectants and antiseptics has been discussed. Its use as the sole test organism for inhibitory antiseptic action and the lack of a "margin of safety" in conjunction with

its utilization as a criterion of germicidal efficiency has been criticised.

It has been shown that *Staphylococcus aureus* may attain a significantly higher resistance than prescribed by the F. D. A. method. Means are described by which cultures resisting 1:60 phenol for over an hour at 20° C. are obtained.

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# A Nutrition Survey of a Small North Carolina Community<sup>\*†</sup>

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**D**URING the last year and a half a nutrition survey has been carried out in a small rural North Carolina cotton mill community of about 400 population. This community was chosen as probably representative of many of the small communities of the state having a single industrial plant. The aim of the survey was to accumulate data on malnutrition in this region, particularly of the so-called subclinical deficiency states, which would serve as a basis for a program of nutrition improvement.

The determination of which individuals and what percentage of any community can be classed as malnourished is a very necessary but very difficult procedure. It is an old epidemiological slogan that no disease can be adequately controlled unless we know where, when, and under what conditions it is occurring. In the case of malnutrition it is not only the fully developed deficiency disease, *e.g.*, pellagra or scurvy, that must be diagnosed. In general, such marked symptoms come on only after prolonged privation and frequently with years of ill health preceding the definite disease. For purposes of control we need to know which individuals have set out

upon the road leading to deficiency disease. It is assumed that the very definite and disabling disease of known signs and symptoms is preceded during the long "incubation" period by a lesser degree of ill health, which for the large populations involved represents a great loss of national vigor and morale. Of the two kinds of malnutrition the "hollow" or starvation hunger hardly needs a laboratory to bring it to light. The problem involved is that more insidious "hidden hunger" that arises from partial deficiency of one or more of the essential food elements, and which, though a part of the "hollow hunger," can also arise in the midst of seeming abundance.

## METHODS

In the North Carolina study the diagnostic procedure chosen was a composite of most of the known methods suitable for survey work that offered probability of yielding useful information on the problem in hand. Malnutrition is a complex stemming from conditions involving all of the metabolic processes of the body. No single diagnostic procedure, as simple as those for malaria, hookworm, or tuberculosis, could be expected to reveal this condition in its entirety. Rather, tests for certain phases could be introduced and these used as indices of the general status. In line with this plan four general procedures were followed in this study:

1. A thorough going physical examination designed to reveal any signs of deficiency

<sup>\*</sup> Read before the Epidemiology Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 17, 1941.

<sup>†</sup> The studies and observations on which this paper is based were conducted with the support and under the auspices of the International Health Division of the Rockefeller Foundation in cooperation with the North Carolina State Board of Health and Duke University School of Medicine.

disease or any condition conducive to such deficiency

2. A careful clinical history with special probing for any symptoms of deficiency state and with a careful survey of food habits
3. An actual food intake survey on each individual covering a period of 7 days
4. The laboratory examination of a 25 ml. sample of blood

In the population studied here the physical examination was of only moderate helpfulness. More direction came from the medical history, particularly the section on food habits which frequently outlined the individual deficiencies subsequently confirmed by the other procedures. The 7 day diet records were carefully supervised during the week the recording was done so that inconsistencies were queried and corrected currently. When finished they were analyzed by reducing all entries to grams and, by use of food tables, were converted into the food elements. Analyses were thus done on each record to show daily intake of carbohydrate, protein, fat, calories, iron, calcium, vitamins A, B<sub>1</sub>, C, and riboflavin.

The laboratory examinations made on the blood were for vitamin C, vitamin A, carotene, total proteins, albumin, phosphorus, phosphatase, hemoglobin, red cell count, and hematocrit. This type of examination being largely biochemical was outside the usual procedures of state public health laboratories. The methods for assaying the various vitamins are still in the formative phase. For these reasons and to have adequate supervision by trained biochemists interested in the problem, the Nutrition Laboratory was set up in the biochemical department of Duke University Medical School. As far as possible the Evelyn photoelectric colorimeter was employed in the work and was used in analyses of vitamin C, vitamin A, and carotene, hemoglobin, phosphorus, and phosphatase. Kjeldahls were done for total proteins and albumin, though in

the second year's work this has been replaced by the falling drop method.

The site chosen for the first survey was an old cotton mill community in the mideastern part of the state having a population of approximately 400 individuals, all of native American stock, most of whom worked in the mill. Their subsistence was largely from the cash income with very little gardening done. Full-time wages in this mill averaged about \$12 per week. The surrounding territory of some 50 square miles was included in the second part of the survey, and is a farming area, chiefly for cotton, corn, and tobacco, with rather low soil fertility. Altogether about 60 per cent of the individuals in the community were included in the survey; all ages and economic levels were adequately represented in the sample. In the mill village the population is entirely white; in the farming area the Negroes are approximately one-third of the population.

The seasons of surveys were spring and fall and these are divided in the tabulations. Two spring surveys are included. A small winter survey of adults only was carried out immediately following the fall survey.

#### RESULTS

The results of certain items studied have been arranged in tables with averages calculated for the community as a whole. In the tables presented here only these community averages are given, with percentages of the individuals found at different levels above or below this average. Table 1 gives some more detailed information for vitamin C in the mill community. With the exception of 6 cases of mild scurvy and 1 of active rickets, no actual existing deficiency disease was diagnosed by the survey. Twelve individuals had histories of pellagra in past years. Physical signs suggestive of early deficiency were indefinite, but the medical and dietetic

TABLE 1  
Plasma Vitamin C  
Spring, 1940

Mg. Vitamin C per 100 ml. Plasma	Individuals at Given Level	Per cent at Level
0	59	27.1
0.1-0.2	74	34.0
0.3-0.5	48	22.0
0.6-0.9	21	9.6
1.0-1.4	13	5.9
1.5-1.9	3	1.4
Total	218	100.0

histories were more suggestive. The results here tabulated are entirely objective giving the nutritional status of the community as judged by the laboratory and diet survey technics. Very definite deficiencies are revealed by these two methods. Judgment as to the effect on bodily vigor and health resulting from these deficiencies is not a part of this paper.

#### DISCUSSION OF RESULTS

*Caloric intake*—The first item investigated was the adequacy of the diet as to quantity or energy value, *i.e.*, caloric content. It was surprising to find that for the portion of the community over 15 years of age the daily intake was, by the methods used, only 2,000 calories. This was only two-thirds of the generally accepted standard of 3,000 calories for men at light work, and looked like a real dietary deficiency. However, judgment was reserved until a control survey was made on a group of doctors and technicians at Duke Hospital who were presumably of good economic status and adequate nutrition. The caloric intake of this group was found to be identical with that of the mill village, *i.e.*, 2,000 calories. In this latter group part of the diets were found to be adequate in all other respects. The conclusion was drawn that data collected by this method show that in this latitude, men at light work can be adequately nourished on 2,000 calories per day. It is possible that the accepted

standards were set up for colder climates and also that modern diets are better balanced in the food essentials.

*Vitamin C*—The most outstanding finding of the first spring survey had to do with vitamin C. Normally the fasting blood contains 0.6 to 1.0 or 1.5 mg. ascorbic acid per 100 ml. plasma, or otherwise stated about  $\frac{1}{2}$  to 1 part per 100,000. One-half this amount, 0.3-0.5 mg. per cent, is generally considered to be probably subnormal, and below 0.3 mg. per cent certainly so. Reference to Table 1 shows that in this small community, 83 per cent of the individuals were below this 0.6 mg. per cent minimum normal level, and 61 per cent were below the 0.3 mg. per cent level. More impressive still, 27 per cent of the 218 individuals showed no vitamin C at all, though only 6 cases of mild scurvy could be diagnosed in the community and all of them were in two families whose dietary excluded vitamin C rich foods. These low blood levels were confirmed by a dietary survey on about 40 per cent of the same individuals, well distributed and on a family basis. This showed an average daily intake of 23 mg. vitamin C, which is about one-half the minimum normal standard. However, over 50 individuals in the community with no detectible vitamin C in the blood showed no signs of scurvy. This puzzling fact is in line with recent investigations which show that in a healthy man, 6 months of nearly complete privation of vitamin C is necessary to produce clinical signs of scurvy.<sup>1</sup> It is probably a rare thing for complete vitamin C privation for extended periods to be met with in American diets. The above figures do show that for shorter periods this privation certainly does occur with complete disappearance of vitamin C from the circulating plasma. To assume that no ill effects were suffered just because the privation was not severe enough to cause scurvy would seem unjustifiable.

Another interesting fact about vitamin C blood levels in this community is that the very low level that existed in the spring of 1940 was greatly improved by the fall of the same year. This is indicated by a resurvey of 53 individuals in the fall as shown in Table 2. The

TABLE 2

*Plasma Vitamin C, Survey of Identical Individuals  
Spring and Fall, 1940*

Mg. per 100 ml. Plasma	Spring, 1940		Fall, 1940	
	Individuals	Per cent	Individuals	Per cent
None	3	5.7	1	1.9
0.1-0.2	20	37.7	9	17.0
0.3-0.5	18	33.9	10	18.9
0.6-0.9	9	17.0	22	41.5
1.0-1.5	3	5.7	11	20.7
Total	53	100.0	53	100.0
Mean	0.4±.04		0.8±.04	

average for this group rose from 0.4 mg. per 100 ml. in the spring to 0.8 mg. in

the fall, which latter is considered a normal level. The shift of individuals to higher levels can be readily seen in this table. It has been previously shown<sup>2</sup> that a very inexpensive diet containing 60 mg. vitamin C daily will raise low fasting blood levels to normal within 6 weeks' time. Subsequent investigations have shown the same result in a much shorter period. A dietetic resurvey in the fall was not made on these 53 individuals, but the rise in blood levels clearly indicates an improvement in dietary vitamin C intake must have occurred. Quite evidently nutrition improves over the summer months when gardens flourish, even though the produce must be purchased. It is the long winter of partial privation that leads to outbreaks of nutritional disease in the spring with actual scurvy probably occurring only in those who started the

TABLE 3

*Plasma Vitamin C*

Period	Group	Total Number Examined	Mg. Vitamin C per 100 ml. Plasma Per cent of Examinees at Given Level					
			Mean	None	0.1-0.2	0.3-0.5	0.6-0.8	0.9+
Spring, 1940	Mill Village White	218	0.3±0.02	27	34	22	8.7	8.3
Fall, 1940	Mill Village White	59	0.7±0.05	3.4	15.2	22	27.2	32.2
Fall, 1940	Rural White	130	0.9±0.03	0.8	7.5	16.9	20.8	54.0
Fall, 1940	Rural Colored	141	0.9±0.03	0	4.3	4.2	25.5	61.0
Winter, 1941	Rural White	54	0.75±0.08	5.5	26.0	26.0	9.3	33.2
Spring, 1941	Rural White	51	0.8±0.06	0	21.5	15.7	5.8	57.0
Spring, 1941	Rural Colored	75	0.6±0.04	1.3	18.7	38.6	17.4	24.0

Suggested vitamin C standards: 0.9 mg. per 100 ml. plasma and above is a normal level; 0.6-0.8 mg. is probably within normal limits; 0.3-0.5 mg. is probably subnormal; 0.2 mg. and below is definitely subnormal.

TABLE 4

*Plasma Vitamin A*

Period	Group	Total Number Examined	Int. Units Vitamin A per 100 ml. Plasma Per cent of Examinees at Given Level					
			Mean	0-34	35-69	70-99	100-149	150+
Spring, 1940	Mill Village White	206	32±0.8	63.5	36.5	0	0	0
Fall, 1940	Mill Village White	59	56±2.5	15.3	64.5	20.2	0	0
Fall, 1940	Rural White	128	69±1.6	0	59.5	36.0	4.5	0
Fall, 1940	Rural Colored	126	64±2.3	4.7	69.0	19.1	5.6	1.6
Winter, 1941	Rural White	47	87±3.8	0	31.9	40.4	25.6	2.1
Spring, 1941	Rural White	49	65±2.0	0	63.2	32.7	0	4.1
Spring, 1941	Rural Colored	72	53±1.5	7.0	81.9	11.1	0	0

Suggested vitamin A standards: For males the normal range is 70-170 International Units per 100 ml. plasma; for females, 100-200.



TABLE 5

*Average Daily Intake of Dietary Essentials by Seasons and by Groups*

Group Means of:	Spring, 1940		Fall, 1940		Winter, 1941		Spring, 1941	
	Mill Village White		Rural White	Rural Colored	Rural White	Rural Colored	Rural White	Rural Colored
Vitamin C (mg.)	22.6		33±2	10.2±1.2	60±6	15±3	53±4.4	54±5.5
Vitamin A (I. U.)	3,985		3803±201	3940±350	4950±325	2837±290	3400±220	3800±320
Vitamin B <sub>1</sub> (mg.)	698		760±29	416±25	818±34	450±26	728±28	690±36
Riboflavin (mg.)	1,044		1244±50	584±45	1391±84	750±53	1167±62	1155±65
Calcium (gm.)	0.53		0.65±0.03	0.37±0.04	0.77±0.04	0.62±0.04	0.75±0.04	0.66±0.03
Iron (mg.)	8.9		8.8±0.2	5.7±0.25	10.7±0.4	7.5±0.3	9.5±0.39	9.0±0.3
Calories	1,930		1765±151	1525±134	2061±19	1511±36	M12071±107 F1577±44	M1690±67 F1443±51
(Age 15 Yrs.+)								
Carbohydrates	219		206±6	148±6.4	228±9	178±7	207±6	189±5
Protein	53		47±1.5	33±1.8	58±2	42±2	51±2	46±1.3
Fat	86		76±3	65±2.7	95±5	74±2	81±3	71±3
No. of Individuals	91		83	50	44	23	65	40

winter in a depleted state as far as this vitamin is concerned. It is the summer recovery period that prevents more serious outbreaks. Perhaps this is the cycle the race is attuned to—winter privation, summer recovery. That it makes for the best in the race is quite questionable. Modern storage methods, including pressure cooker canning and rapid freezing of fresh vegetables, has made it possible to by-pass this stone age cycle and carry over the summer abundance to reduce the scarcity of winter, not only dried and easily stored foods, but also the succulent, life sustaining vitamin C foods. The above figures indicate that a large percentage of the population of which this community is representative is quite inadequately served by these modern methods in food storage and marketing technics. This vitamin C problem is so closely tied up with several other essential food element privations that solving one will solve several problems.

In interpreting the tables showing seasonal variations it is to be stressed that with the exception of Table 2 on vitamin C, the groups shown in the tables are not identical, and comparisons from season to season are therefore not justified. It is worth mentioning that the suggested increased intake levels in the spring of 1941, especially in the Negro,

could well be due to the government distributions of surplus commodities to the schools, chiefly citrus juices and milk.

*Other vitamins*—Other findings in the survey can be read from the tables. Vitamin A levels in the blood plasma were at the bottom of the suggested normal band. This checks with the food intake study which showed the carotene or provitamin A content of foods eaten were just at the minimum normal level. When it is considered that probably as low as 50 per cent of this is actually converted into vitamin A in the body, then the inadequacy of intake becomes evident. A borderline adequacy is an unsatisfactory level; any accident, sickness or fever would greatly increase the need and throw the individual promptly into a deficiency state.

Vitamin B<sub>1</sub> (thiamin) intake of about 700 micrograms daily as found in the first spring survey was only about one-half the minimum normal standard. In the Negro population the intake was below one-third the normal level. This fits in well with the clinical finding that a large percentage of hospital patients respond well to vitamin B<sub>1</sub> concentrates. For the non-hospital population a procedure far more rational than the propaganda for generalized use of vitamin concentrates would be the encourage-

ment of the use of vitamin B<sub>1</sub> rich foods in the diet, particularly whole cereals and whole grain breads which rank as cheap foods. By this method other necessary food elements, even some unknown ones, would be included.

Riboflavin, a member of the B complex, is now more generally recognized as a vitamin, privation of which leads to a definite disease complex. It is concerned with eye as well as skin health, and is suspected of being concerned with preventing premature old age. The best and most easily available source is milk. In the mill community survey the riboflavin intake was about one-half the normal standard recommended by the Committee on Nutrition and Foods of the National Research Council; the rural white had a level somewhat higher, while the rural Negro received only about one-third the standard. The very numerous individuals who had adequate intake of this vitamin were almost invariably heavy milk drinkers. The family cow was the custom in the white rural farm family, but a rarity with the Negro.

*Minerals*—Closely connected with the milk intake is the calcium content of the diet. Growing children in particular stand in need of this bone-building element. The normal intake of calcium per day was fixed by the National Research Council Committee at 0.8 gm. daily for adults and 1.0–1.4 gm. for children. In the mill community survey the adults received a daily average of 0.5 gm. and the children 0.6 gm. Surveys in other groups in other seasons were slightly higher (0.77 gm. maximum) except in the Negro fall group which had 0.37 gm. average daily intake. In the spring the average Negro intake was 0.66 gm., due, it is believed, to the canned milk distribution in schools that winter by the Surplus Commodity Corporation.

The iron intake for the adult of the mill community averaged 8.9 mg. in

the spring. In the fall the rural whites had this same intake, but the Negroes had 5.7 mg. A fairly well to do rural white group in the winter had 10.7 mg. daily intake of iron, and a Negro group 7.5 mg. The former normal standard for adults was fixed at 15 mg. daily intake, but this was lowered by the National Research Council Committee to 12 mg. By such standards the iron intake in this community was definitely subnormal. It is of interest to compare this with the hemoglobin readings. In the spring, 1940, survey the mill group male averaged 13.7 gm. hemoglobin per 100 ml. blood, the female 12.6 gm.; male children under 12 years averaged 12.3 gm., female children 12.6 gm. This community was outside the hookworm and malaria areas of the state. It seems to follow from these figures that the community was only slightly anemic, with an iron intake only three-fourths the recommended level.

#### SUMMARY

The nutritional status of a small North Carolina mill community was surveyed in the spring and fall, 1940–1941, with special reference to the amount of preclinical food deficiency present. The methods used were clinical, laboratory, and dietetic. Results show a surprisingly low vitamin C level in the blood in the spring, but with very little scurvy present. In the fall this level in a sample of the same group was much higher and within normal limits. With the exception of 6 cases of mild scurvy and one of acute rickets, no clinical deficiency disease was diagnosed in the community.

Subnormal intake was also noted for vitamins A, B<sub>1</sub> and riboflavin, calcium, and iron. Blood levels were slightly subnormal in vitamin A and hemoglobin.

The community was in general considered to be moderately malnourished and in this probably representative of quite large similar groups in the state.

A program of nutritional improvement is suggested, through health education in food habits, better distribution of gardens, farm animals, and food preservation processes, and coöperation with federal surplus commodity programs.

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## Delayed Birth Registration

WITHIN recent months, a number of bills have been introduced into Congress, intended to permit the issuance of delayed birth registration certificates by federal agencies. The outstanding bills are:

H.R. 6600 (introduced by Congressman Dickstein). This provides for issuance of certificates of citizenship by the Commissioner of Immigration, of the Department of Justice, on the basis of "satisfactory proof." The bill also provides for the determination of age by the U. S. Department of Justice when necessary to be determined by any branch of the United States Government. This bill has passed the House and was referred on March 20 to the Committee on Immigration of the U. S. Senate.

S. 2299 was introduced by Senator Reynolds on February 23 and is at present in the hands of the Senate Committee on Military Affairs. The bill is supported by the U. S. Army and pro-

vides for a "certified birth record" to be issued by the Director of the Census upon the basis of finger prints and evidentiary records transmitted to him through postmasters of first and second class.

The Conference of State and Provincial Health Authorities of North America on March 24 voted not to endorse either bill, and instructed a committee to draw up a bill looking toward more adequate financial support and implementation of existing state systems.

Pursuant to the resolutions adopted at the Atlantic City meeting of the American Association of Registration Executives, a Commission on Vital Records has been appointed by Administrator Paul V. McNutt of the Federal Security Administration to study the problems of vital statistics agencies, both from the standpoint of the present emergency and the long range outlook. Dr. L. J. Reed of The Johns Hopkins University is Chairman.

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## GONORRHEA GETS A PLACE IN THE VENEREAL DISEASE PROGRAM

FOR a great many years, gonorrhea was the foundling of anti-venereal disease effort: a wet-diapered and puny little bastard that would neither get well nor die. Scarcely anyone was willing to claim gonorrhea as a legitimate responsibility of the venereal disease program, for when health authorities spoke of venereal disease clinics they meant syphilis clinics; and when epidemiologists referred to tracing the source of a venereal disease they really meant tracing the source of a syphilis infection. It is true that there were a few voices crying for recognition of the seriousness of the problem of gonorrhea, but they got lip-service agreement rather than the action they urged; and whereas, at the clinic table, majestic syphilis sat at the head, plebeian gonorrhea occupied a place well below the salt.

This situation existed not because of a failure to recognize the public health significance of the disease, but was rather a defeatist attitude. The problem was too vast, the resources were too meager. Infection was widespread, treatment unsatisfactory, the end point of cure difficult to determine. Drugs administered came essentially under the heading of palliatives, and to believe that local treatment by injections of antiseptics was reasonably effective strained both the optimism of the therapeutic enthusiast and the credulity of the ignorant. This local treatment strained, too, the clinic staff. Irrigation of a case of gonorrhea is not a procedure that professional personnel enters upon with gusto. It is a dirty job, and time consuming, so, with few exceptions, attendance of cases of gonorrhea at the public clinic was not encouraged. This, perhaps, was just as well in view of the aphorism of Dr. Edward L. Keyes, quoted in a recent *Journal* article by John L. Rice: "The prime essential in the successful treatment of gonorrhea is to get the physician out of the urethra."

For purposes of argument, however, let it be recognized that an uncertain proportion of cases of gonorrhea became symptom free under the old treatment. There arose then the question of whether or not they were really cured. One had to rely upon direct smear which, while reasonably satisfactory in acute cases,

and fairly reliable in males, is not a productive method in determining the presence of the gonococcus in females, and is in all instances subject to the limitations of any direct-smear-microscopic examination. The same question of whether or not a case is still in a communicable stage continues to exist even though the treatment of gonorrhea has been revolutionized. Fortunately, sharper bacteriological methods are now available, and it is practicable for any good laboratory to run cultures on material suspected to contain gonococci. This culture method is not, of course, infallible. There have even been instances where, in material from the same case, the direct smear disclosed gonococci and the culture did not. The more usual outcome of controls of this sort, however, is that the culture picks up as positive about fifteen per cent of those cleared as negative by direct smear examination.

On the basis of this knowledge, most of the larger health departments and some of the smaller ones have shaped their procedures in release of persons known to have had gonorrhea, particularly in relation to the problem created when women are arrested on the euphemistic charge of "vagrancy." In San Francisco, the status of such women, as regards gonorrhea, is determined by culture. If positive they are isolated and treated. They may not be released in less than six weeks and then only on three successive negative cultures; in New York there is essentially the same procedure, except that there is no fixed minimum period of isolation: one might be released in less than six weeks if three successive negative cultures were obtained.

Thus, just as the newer sulfa drugs have replaced the cruder and less effective local irrigations in the treatment of gonorrhea, so is the culture method displacing the old and unsatisfactory direct smear procedure in determining the end of the period of communicability. These two reasonably satisfactory methods of handling this disease tend to place gonorrhea within the category of controllable diseases. And it is about time that this was done.

### WHAT AND WHO IS AN EPIDEMIOLOGIST?

RECENTLY a colleague of ours was introduced to a Professor of Physiology. "And what is your particular interest?" asked the Professor. "I," said our colleague, "am doing research and teaching in epidemiology." "Ah, I see," observed the physiologist, "you are in the Department of Bacteriology." Again, and this time the clinician: "One cannot from cases reported to the health department learn the epidemiology of a disease. Such data will not include all cases, and will include non-cases. Exact epidemiological conclusions may be drawn only from the clinician's own observation." And then the statistician enters the argument with rigid references to comparability, probability, ranges, errors, correlations, and regressions.

In the circumstances, it is understandable if one asks, are epidemiologists born or made or just self-confessed? May the clinician, the statistician, the bacteriologist properly designate himself as an epidemiologist? Can one be an epidemiologist and something else besides? Does the first-hand experience of a quarantine officer take him within the fold? What about one who, in retrospect, studies the data of past epidemics; and the medical historian with intimate and detailed knowledge of the classic writings in epidemiology? One who concentrates upon a single disease—its laboratory, clinical, and epidemiological aspects—is he an epidemiologist in general or only in particular? May one not formerly an epi-

demologist reach this state merely by being given responsibility for epidemiological work, or if once an epidemiologist is one always an epidemiologist? Is epidemiology a status that may be conferred by acclamation or announcement, and does portentousness of manner and mien tend to cause colleagues to accept one as an epidemiologist?

On the subject of what and who, and even why, is an epidemiologist, we invite letters to the Editor. Some of these letters might even be published.

## IN THE SLUMS OF PUBLIC HEALTH IGNORANCE

GEDDES SMITH, in his admirable *Plague on Us*, provides a thriller touch in the titles he chooses for identification of certain epidemiological episodes: *The Case of the Ladylike Oysters*, *The Case of the Wading Boys*, etc. Perhaps this is a useful method for directing attention to other public health episodes, episodes which occur because of the cupidity or ignorance of man, and which illustrate the complexities of modern civilization. Here then, are samples of things that have arisen in what might be called the underworld of public health.

*The Metallic Snuff Case*—Some of our citizens, whose foreign background is pretty recent, prefer a European type of snuff, which has a greenish color. War conditions made it impracticable to import, and so a manufacturer achieved the same color effect by adding to native snuff some fifteen per cent of lead chromate, with the results that one would expect.

*The Case of the Too-Shiny Forks*—An easy way to make silver bright is to put it into a solution containing a dash of cyanide. Manufacturers, knowing this, put such a silver brightening powder on the market. Unfortunately, small portions of the powder sometimes stuck to the eating utensil, and from the ensuing cramps, diarrhea, and collapse, one concluded that the clams must have been bad. Huntington Williams explored this subject epidemiologically and now, in most places, the use of this polish is taboo.

*The Mystery of the Necrosed Jawbones*—Why did certain workers engaged in an industry important in World War I suffer from a mysterious illness, which eroded their bones and in a number of cases caused death? It was radium poisoning. Today, through periodic radon tests, luminous paint workers are protected.

*Who Poisoned the Parson?*—In the days of prohibition, fluid extract of ginger was a favorite and reasonably potent drink, and in some sections of the country there was a fine market for it. An enterprising manufacturer found that tricresyl phosphate could be substituted for the ginger component and would serve just about as well. It was cheaper, and on government test gave a result comparable to that of the ginger itself. And so this adulterated fluid extract of ginger went on the market. Among thousands of others, the preacher, who should have been above such things, drank the stuff in lieu of whiskey—and they all developed serious peripheral neuritis. Now, under food and drug regulations, cresyl phosphate may not be substituted for ginger.

*The Curse of Cadmium*—Housewives had become accustomed to aluminum kitchenware and refrigerator trays. When aluminum went into war production some manufacturers attempted to give to their products an aluminum or stainless steel appearance by plating them with cadmium. The illness that arose in a number of purchasers was a gastroenteritis: the type of thing which the public and some physicians erroneously call "ptomaine poisoning." Actually, it was

cadmium poisoning. At present there is no specific law against this use of cadmium, but the Office of Production Management will not in future release cadmium for plating food utensils.

*Giovanni and the Almond Paste*—If one eats a large number of almonds, he might take in enough prussic acid to get symptoms. Heat, however, breaks down this dangerous ingredient, so that paste made of almonds which have been subjected to high temperatures, as usually is the case, is all right. Giovanni and his playmates bought and ate great gobs of almond paste candy which, as it were, was in the raw. They didn't die but they were pretty sick.

Naturally, these are only a few of the many similar episodes which have occurred in recent years. One need not be astonished that they happen. It is remarkable that they are not more frequent and disastrous. Generally, as a matter of good business, to say nothing of common decency, those who were responsible for these things did not realize the danger or were careless. But there will always remain some who consider first the money to be made by a substitution here or an adulteration there and consider only secondarily, if at all, the havoc which may be wrought by such procedures. From time to time and in diverse places, evidences of their racketeering will come to light, but the swift recognition of the source and character of the trouble and the effective control measures taken in the past give encouragement that as new problems arise they will be dealt with promptly.

## BOOKS AND REPORTS

### Books of Special Interest to Public Health Workers

MAZŸCK P. RAVENEL, M.D.

*"That place that does contain  
My books, the best companions, is to me  
A glorious court, where hourly I converse  
With the old sages and philosophers."*

JOHN FLETCHER

AGAIN we are offering a review of books along the lines of public health which have appeared during the year and which we consider of especial use to all workers in public health projects.

There have not been as many textbooks on matters concerning public health as usual. From some points of view this is regrettable but, on the other hand, so many new things have happened and are happening every day that, as pointed out under one heading later, an admirable textbook which has already undergone three revisions is behind the times in respect to the "blasts" which occur from aerial bombing.

While prevention is the watchword of an Association like ours, it has seemed wise to venture somewhat into the field of treatment. First aid, for example, is now one of the most efficient measures in the preservation of human life and the avoidance of crippling and exhausting consequences.

#### BIOGRAPHY AND HISTORY

This year has brought out a number of interesting and more or less important biographies. There are a number of histories bearing on medicine, including one monumental work on the history of medicine itself. From these we have selected: *A Surgeon's Life—The Autobiography of J. M. T. Finney*, Putnam, which contains much interesting history, principally of Johns Hopkins Hospital and its personnel. An interesting note is the story of the adaptation of the rubber glove for surgeons, now universally used. There is also an interesting story of the politics back of the appointment of one Surgeon General of the Army. Delightful reading, in spite of a New England opinion to the contrary. *L. Emmett Holt: Pioneer of a Children's Century*, by R. L. Duffus and L. Emmett Holt, Jr., Appleton-Century. The name of Holt is intimately con-

cerned with the history of child health in America, and in this review we have called attention to the 11th edition of his book on *Diseases of Infancy and Childhood*. This story of his life is sympathetically written by his son and a well known newspaper man. It will be welcomed by all who are interested in children's welfare. *Hugh Young: A Surgeon's Autobiography*, Harcourt, Brace. Biographies and autobiographies if honestly done are always interesting. "Lives of great men all remind us." Even though this quotation may not be entirely apt in the present instance, the book is beautifully printed, with colored plates, and in a style suitable "for handsome Hugh." *A Yankee Doctor in Paradise*, by S. M. Lambert, Little, Brown, tells a wonderful story of the conquering of hookworm in the South Sea Islands. It is recommended to everybody for its history, its anthro-



pology and its humor—delightful and informative reading for the overworked doctor. *Papers of Wade Hampton Frost, M.D.—A Contribution to Epidemiological Method*, edited by Kenneth F. Maxcy, Commonwealth Fund, is a part of the story of a man who had a great influence on the study of epidemiology in America, perhaps greater than any other one man, and who died entirely too soon. *A History of Medicine*, by Arturo Castiglioni, Knopf. There is always reason for the study of the history of medicine. This is an especially good book, well translated from the Italian by Krumbhaar, of the University of Pennsylvania. It is highly recommended to physicians, public health workers, trained or otherwise, and to general readers. *Man's Greatest Victory Over Tuberculosis*, by J. Arthur Myers, Thomas, is the story of the part the veterinary profession has played in the eradication of tuberculosis in cattle, a gigantic undertaking which seemed well-nigh impossible, but has been accomplished to an amazing degree. Incidentally, it tells the story of the constant improvement in the standards which have brought the veterinary profession to its present high standing. Indeed the author, who is a physician himself, and has made a special study of tuberculosis, says that human medicine is 40 years behind veterinary medicine in regard to tuberculosis control. In America, which probably leads all great countries in the purity of its milk supply, we have become so accustomed to accepting the high standards that we are apt to forget those who worked against great odds to bring this condition about. This book makes the history available to the public. *William Henry Welch and the Heroic Age of American Medicine*, by Simon Flexner and James Thomas Flexner, Viking Press, is an unusually intimate biography. In addition to his own history, it gives much of the histories of his various activities

including his work in the Johns Hopkins Medical School and Hospital and the Rockefeller Foundation. Elsewhere in this issue, an extensive review of the book appears.

#### CHEMOTHERAPY AND SERUM THERAPY

No outstanding work has come to our attention on this subject during the year. There have been numerous articles and considerable extension in the number of sulfur compounds and their use which can be found in the current literature.

#### CHILD HYGIENE AND TRAINING

There was a dearth of these books in 1940, and a still greater dearth during 1941. The literature abounds in references and short articles. We welcome *Holt's Diseases of Infancy and Childhood*, by L. Emmett Holt and John Howland, 11th ed. revised by L. Emmett Holt, Jr., and Rustin McIntosh, Appleton-Century. The author was a pioneer in and founder of preventive pediatrics in this country. His book has been standard from the first edition. It has now grown to 1,421 pages but no more authoritative work exists.

#### ENGINEERING

No outstanding work in this field has come to our attention during this year except *Sewage Treatment*, by Karl Imhoff and Gordon M. Fair, Wiley. This book was published in 1940 and reached us belatedly in 1941. It is a good and useful book at any time.

#### HOUSING

The housing problem in America is acute. There has been tremendous dislocation of homes and families. Immense industrial plants for munitions, airplanes, high explosives, tanks, etc., have sprung up in many parts of the country. Many, many millions of dollars have been spent for plants of all sorts. The builders of these move in on short notice, and their completion

will bring demands for thousands of homes for the operatives. Many articles and discussions have found their way into print, but it is apparently all too new to have found its way into books, with few exceptions, one being, *Industrial Housing in Wartime—Results of the Competition Organised by The Royal Institute of British Architects*, London. This is an authoritative book coming from the highest authorities in England after a prolonged study. The housing problem in America is already acute and there is every evidence it will be more acute when victory comes. This book contains a great deal of value for us in this country. Another exception is *Housing for Health*, by various authors, Committee on the Hygiene of Housing, American Public Health Association. This deals with housing codes, housing surveys, and slum clearance, particularly from the standpoint of the health officer, and with other matters of interest to both health officials and housing experts.

#### INDUSTRIAL HYGIENE

The many new endeavors which we have undertaken and the speed required make the subject of industrial hygiene of unusual importance. Again we can say that the literature is full of the subject but little has attained permanent form. The following are outstanding studies which have reached the book stage: *Manual of Industrial Health Hazards*, by Joseph B. Ficklen, Service to Industry. With the diversion of all forms of industrial work toward defense efforts, carrying with it the increased use of new and some comparatively unknown chemicals, this book is a reliable guide and experienced authority, especially useful because it is brief and to the point. *Sewage Treatment Works: Administration and Operation*, by C. E. Keefer, McGraw-Hill, is a timely and needful book, written with a definite purpose and showing careful planning

and execution. It is an up-to-date text and reference book, useful for professional engineers, state and municipal officials, plant superintendents, etc.

#### LABORATORY

While the Laboratory Section of our Association is large and active, owing to the conditions which have affected other departments, textbooks on laboratory procedure have been few, though many shorter articles are found in the current journals. Books which have been reviewed are: *Diagnostic Procedures and Reagents*, by various authors, American Public Health Association, is considered an indispensable addition to the library of practising bacteriologists and serologists. It is more comprehensive than the ordinary laboratory manual and more serviceable than some of the larger texts on laboratory methods. *Approved Laboratory Technic, Clinical, Pathological, Bacteriological, Mycological, Parasitological, Serological, Biochemical and Histological*, by John A. Kolmer and Fred Boerner, Appleton-Century, has been revised (3rd ed.) and brought up to date in most respects in 1941. Curiously, it is not up-to-date on the typing of pneumococci and in the section for the examination of milk. In spite of these defects it is a very useful and comprehensive manual of laboratory methods.

#### MENTAL HEALTH

Mental health has been drawing the increased attention of all health workers for some years past. The emergency increases its importance. The following books on the subject can be recommended: *Psychotherapy*, by Lewellys F. Barker, Appleton-Century. The assembling of large bodies of men in constricted areas with the necessary discipline of training invariably brings to the front a number of mental maladjustments. The conditions of actual

war subject men to mental and physical strains which present many problems. This book gives a discussion containing expositions and interpretations which are simple, terse, and readable. There will be much use during the next few years for this book, which is a personal and helpful treatise. *Mental Disease and Social Welfare*, by Horatio M. Pollock, State Hospitals Press, is the result of a long experience in handling mentally ill people by a sympathetic and practical man. Even in ordinary times, about 5.5 per cent of all people born may be expected to enter a mental hospital at some time in life. The proportion will be larger in such times as we are having. It is reassuring to note that many patients are restored to normal community life and that relatively few commit criminal offenses. These facts are evidence that our hospital methods are producing beneficial results not only to the patients but to the community.

#### NURSING

Never was there such demand for nurses, especially public health nurses. One has only to read the daily papers and medical journals to see the tremendously increasing demand for all types of nurses. *The Public Health Nurse and Her Patient*, by Ruth Gilbert, Commonwealth Fund, is an epochal book marking a long step forward in the development of nursing and can be read and re-read. It is recommended not only for nurses but for health officers and their medical staffs. *Communicable Diseases*, by Nina D. Gage and John Fitch Landon, Davis, is an excellent, up-to-date book for nurses, which one reviewer says is "the most usable book this reviewer has seen on this subject." Already there are reports of an increasing incidence of tuberculosis which might be expected. However, it emphasizes the importance of books on its prevention and control, and proper

nursing of the disease itself. *Tuberculosis Nursing*, by Grace M. Longhurst, Davis, is an excellent book written for student nurses, but invaluable to nurses generally for reference. If history repeats itself there will be entirely too much use for a book of this sort before our troubled world can smile again. *Nursing in Prevention and Control of Tuberculosis*, by H. W. Hetherington and Fannie Eshleman, Putnam, is another excellent study on nursing in tuberculosis, especially recommended for those who have had little or no special training in this field.

#### NUTRITION

We are again being bombarded with slogans concerning nutrition, and terrible pictures of our population allegedly brought about by improper feeding. The current literature is overcrowded with articles on nutrition in general. The majority of these add nothing to our knowledge. It looks as though every little first course student in home economics feels impelled to take part in the barrage, and we have developed a new word, "nutritionist," which is enough to make any lover of good English scream. Frankly, while our advice has not been asked, we believe that one good standard book, such as those recommended below, is worth hundreds of the fly-by-night articles which are now afflicting our eyes. *Dietetics Simplified: The Use of Foods in Health and Disease*, by L. Jean Bogert; Laboratory Section by Mame T. Porter, Macmillan, is now in its second edition, and has been most favorably reviewed as being practical and thoroughly scientific, and, on this account, of service to home economics students, hospital dietitians, public health nutritionists, nurses, and medical students. *Essentials of Nutrition*, by H. C. Sherman and Caroline Sherman Lanford, Macmillan, is a readable and adequate review of the essentials written especially for laymen who

wish to understand the relation of food to health. It is useful for all classes of readers. *Chemistry of Food and Nutrition*, by H. C. Sherman, Macmillan, is a sixth edition of a standard book which has been brought up to date, and can be recommended.

#### ORAL HYGIENE

Oral hygiene is still in the picture. Everyone recognizes its importance in nutrition and in general health, but in spite of many discussions and some experimental studies of high order, we seem as far from a knowledge of some fundamentals, especially those concerning the decay of teeth, as we were nearly a hundred years ago. We can only state that conditions seem to be improving. Only one book has come under our observation which can be recommended: *Your Teeth: Their Past, Present, and Probable Future*, by Peter J. Brekhus, University of Minnesota Press, is timely and excellent, a challenge to dentists to look upon their problems from a broader point of view. The last chapter, "How We Can Save Our Teeth" will be of special interest to the general reader. Despite the fact that none of the controversial points concerning dental caries are cleared up authoritatively, the book is an important contribution, especially in showing the relation of dental diseases to public health, in particular that phase of it relating to nutrition.

#### PUBLIC HEALTH

There has been the usual crop of reports from state and city health departments, most of which are more than a year behind time. During the year very few books under this heading have come to our attention, though much can be found in current literature which might be put under this classification. *The 1940 Year Book of Public Health*, edited by J. C. Geiger, Year Book Publishers, is an excellent review of the

literature on public health, up to date, and presented in a handy volume—most useful. *Rheumatic Fever: Studies of the Epidemiology, Manifestations, Diagnosis, and Treatment of the Disease During the First Three Decades*, by May G. Wilson, Commonwealth Fund. This is an excellent study of that puzzling condition with its many aspects which ranks as the third most important of the chronic infectious diseases, so presented that it can serve both as a textbook and for reference.

#### TEXTBOOKS AND NEW EDITIONS

Few textbooks have come to our attention during the year, but a number of new editions of standard works have appeared. It does not take long for a textbook on public health to become obsolete these days, though of course many fundamentals must remain the same. *Bacillary and Rickettsial Infections: Acute and Chronic, Black Death to White Plague*, by William H. Holmes, Macmillan, is the result of 27 years' experience, and, though written primarily for medical students, it is written with such simplicity and lucidity that it should appeal to a wide range of readers. The increasing importance of the rickettsial infections has been recognized. *Public Health Administration in the United States*, by Wilson G. Smillie (2nd ed.), Macmillan, has been enlarged, improved, and brought up to date. It is notable for its clarity and precision. The book has made a place for itself in public health literature. *Manson's Tropical Diseases*, edited by Philip H. Manson-Bahr (11th ed. rev.), Williams & Wilkins, needs simply an announcement. It should be found in the library of every agency and student concerned in the field of medicine and public health, especially in warm climates. *Introduction to Parasitology: With Special Reference to the Parasites of Man*, by Asa C. Chandler (6th ed. rewritten and enlarged), Wiley, needs

only a mention as it has been standard since the first edition 22 years ago. This last edition, up-to-date, should receive an enthusiastic reception by students and teachers of parasitology and public health workers. *Preventive Medicine*, by Mark F. Boyd (6th ed.), Saunders, is an excellent reference and one of the best of its type. *Diseases Transmitted from Animals to Man*, by Thomas G. Hull (2nd ed.), Thomas, has been brought up to date and considerably improved over the first. It is not entirely sound in its consideration of the amount of pulmonary tuberculosis in human beings due to the bovine type of bacillus, but, on the whole, it is a most useful and practical book, especially in the present emergency. *The Avitaminoses*, by Walter H. Eddy and Gilbert Dall-dorf (2nd ed.), Williams & Wilkins, will serve as an excellent guide in this bewildering field of nutrition for the busy practitioner or health officer. The knowledge of few subjects has grown more rapidly than that of the vitamins, so that this second edition of a standard book is welcome. It is up-to-date, giving us the chemistry of vitamin K, and tells of the synthesis of B<sub>1</sub>, etc. *Public Health and Hygiene*, by Charles F. Bolduan and Nils W. Bolduan (3rd ed.), Saunders, is a text filled from cover to cover with useful information, condensed, free from padding, and appropriate for its intended field.

#### MISCELLANEOUS

Under the heading of Miscellaneous we have included a number of books which might perhaps be classified under more appropriate headings. Classification of such books is largely a matter of one's judgment. Some books touch on so many fields that it is hard to place them in a restricted category. *The Virus: Life's Enemy*, by Kenneth M. Smith, Macmillan. While it is not clear for what class of readers this is intended, and it has a number of faults,

the author has summarized a large amount of material in a thought-provoking manner. Virus diseases are attracting much attention and threaten the welfare of man, animals, and plants. There are few more important subjects. *The Parasites of Man in Temperate Climates*, by Thomas W. M. Cameron, University of Toronto Press. With the wide distribution of our Army and Navy, as well as civilians, this brief and authoritative presentation of the parasites which not only plague but produce disease in the human body is timely. Books of this type are often more generally useful than the more profound treatises on the same subject. *Tuberculosis and Genius*, by Lewis J. Moorman, University of Chicago Press. Tuberculosis affects our lives from so many different angles that anything concerning it is of interest. This is a discussion which will hold the reader's attention and doubtless give courage and inspiration to most of those afflicted with the disease as well as promote tolerance and sympathy in those who come in contact with them. *The Streptococci—Their Descriptions, Classification and Distribution, with Special Reference to Those in Milk*, by William D. Frost and Mildred A. Engelbrecht, Willdof Book Co., is an excellent study, which although not entirely orthodox in certain respects, has done much to simplify the study of milk from the hygienic standpoint, but also shows the necessity for further investigation as to the classification of streptococci. *Plague on Us*, by Geddes Smith, Commonwealth Fund, is a book on epidemiology for laymen, written by a layman. It is recommended to all thoughtful and intelligent laymen, and even suggested as required reading to all introductory in epidemiology. It was the principal selection of the Scientific Book Club for February, 1941. *A Symposium on Human Malaria*, edited by Forest Ray Moulton, Science Press Printing Company, is a

systematic, comprehensive, authoritative and thoroughly documented discussion of the problems of human malaria in North America and the Caribbean region.

BOOKS ESPECIALLY USEFUL  
AT THIS TIME

In view of the emergency we have gone somewhat afield. We have pointed out in explanation of the inclusion of certain works on treatment that first aid and emergency treatments were great factors in hindering such bad results as prolonged convalescence, deformities, and even fatal issues. It has occurred to us that it might be useful to put under one heading a number of well worth while books which war has made of especial importance this year. While some of these books are technical and are recommended almost exclusively to those with training in certain medical specialties, there is no doubt that a wider knowledge of prevention in all conditions of warfare will be of assistance in maintaining confidence and in the proper direction of effort. *Health and Efficiency of Munition Workers*, by H. M. Vernon, Humphrey Milford. The author of this book is a pioneer in such studies and has served for a long time as an investigator of the Munitions Workers Committee and Industrial Health Research Board of Engineering. It should be of great value to us in this country, keyed up as we are, to war production. *Lectures on War Neuroses*, by T. A. Ross, Edward Arnold. These lectures are recommended as being especially clear and well put, of value both to civilian physicians and to those in the Army or Navy. *Veneral Diseases*, by E. T. Burke, H. K. Lewis, is an especially good guide for diagnosis by an author of wide experience. *Medical Diseases of War*, by Sir Arthur Hurst, Edward Arnold. Based on the author's experience in the R.A.M.C. during World War I, the value of the

book led to a revision in 1918. It has now been brought up to date as far as possible, but already requires some further revision to take care of the "blasts" due to bombing. The book is authentic throughout and contains pioneer studies on the functional nervous disorders. *Scabies—Civil and Military—Its Prevalence, Prevention and Treatment*, by Reuben Friedman, Froben Press, is called a "Sign of the Times." From 1914 to 1918 skin diseases were responsible for 90 per cent of the illness in the Army. It is an admirable book and considered an outstanding contribution to a matter of growing importance. It contains a good history of the disease and states that Napoleon was a victim of scabies. *Medical Problems of War*, by Hugh Clegg, J. M. Dent and Sons. This is short and non-technical and written for laymen under war conditions. It also touches on post-war planning. *Cambridge Evacuation Survey: A Wartime Study in Social Welfare and Education*, edited by Susan Isaacs, Methuen and Co., is an excellent study, though it must be remembered that the whole problem is in a kaleidoscopic condition. Certainly the experience of England in this respect must be of value to us in this country. *Military Medical Manual*, Military Service Publishing Co. (4th ed.). The great increase in the medical personnel of our Army due to the present emergency makes the appearance of the 4th edition of this excellent manual timely and welcome. *The Officers' Guide: A Ready Reference on Customs and Correct Procedures Followed Within the Army Which Pertain to Commanding Officers*, Military Service Publishing Co., is for the use of all officers of the Regular Army, National Guard, and Officers' Reserve Corps. In spite of the terrible title, this is a very useful book. It goes much further than telling the officers of the various branches of the service how to

conduct themselves on all occasions. There are valuable sections on personnel, keeping fit, etc., all of which pertain to the health and morale of a corps. It is an excellent book and most timely. *Special Surgery in War Time*, by D. W. C. Northfield, Eyre and Spottiswoode, contains the combined wisdom and experience of five authors. The entire book is short, the articles are brief, authoritative, and preëminently practical. It deserves the highest praise. *Surgical Nursing*, by E. L. Eliason, L. Kraeer Ferguson, and Evelyn M. Farrand (6th ed.), is "everything a textbook should be: clear, concise, well illustrated." It is especially timely. *Air Raid Precautions*—First American Edition, Chemical Publishing Co., Inc. It is not a comfortable thought that this book must be recommended. It is an English work published for Americans. So many factors concerning health are involved which are of direct concern to those who are evacuated or must seek air raid shelters, to say nothing of the surgical accidents which occur, that this book is timely, written in the light of the devastating experience of the English. *Emergency Surgery*, by Hamilton Bailey, Wm. Wood (4th ed.), has had three editions and two reprints since 1930. It is extremely comprehensive and covers emergency surgery in a remarkably able manner. *Medicine Versus Invasion: The Home Guard*

*Medical Service in Action*, by G. B. Shirlaw and Clifford Troke, Secker and Warburg, is a most stimulating book and the time of its appearance is appropriate. While this review is being written, the radio and newspapers are telling us of American ships being torpedoed in sight of our shores, both the Atlantic and Pacific, incredible but true. *Warwick and Tunstall's First Aid to the Injured and Sick*, edited by Norman Hammer, John Wright and Sons, is an advanced ambulance book, full of excellent suggestions and explanations. The authors consider it wise to teach the greatest number of people possible the simplest common sense facts that tend to save life—a timely and excellent book. *Tropical Tips for Troops*, by E. T. Burke, W. Heinemann, is intended both for officers and men, and is recommended for the reading of those who are about to go on military expeditions. The English review says the book will be in great demand for such purposes. It is equally certain that our men will be exposed to the tropics throughout a large part of the world, and the book should be useful for them. *Organization, Strategy and Tactics of the Army Medical Services in War*, by T. B. Nicholls, Williams & Wilkins (2nd ed.), is written for the British Army, but should be most useful for Americans. It covers a wide scope and fills a long-felt need.

**Teaching Preventive Medicine to Medical Students**—*With Special Reference to the Use of Health Department Facilities*—By Hugh R. Leavell, M.D., Dr.P.H. New York: Commonwealth Fund, 1941. 77 pp. Price, \$.25.

This is a valuable monograph. It contains much factual data which have been obtained by both observation and correspondence. Its purpose is to determine the use of health department

facilities for teaching medical students. This has been well done. It includes personnel, methods of instruction, organization, publications, and summaries.

The author presents about three pages of conclusions based on the study. These represent analysis of the data which were obtained. There are also 65 valuable references on the subject of teaching preventive medicine and public health to medical students. It seems to

me adequate safeguards were used in analyzing the data. The points of view expressed are dependable.

This study is particularly significant because

1. It presents a record of present health organizations and administrative practices with reference to instruction of students.
2. It presents details and summaries of qualified opinion concerning relative values and needs in teaching preventive medicine.
3. It considers the interests of both the medical school and the official health agency.
4. It presents in one publication selected extracts from the literature and a well chosen bibliography for those engaged in teaching.

The author is to be congratulated upon the completeness of the investigation.

W. S. LEATHERS

*The Principles of Dairying—By Henry F. Judkins. Revised by Merrill J. Mack (3rd ed.). New York: Wiley, 1941. 315 pp. Price, \$3.00.*

This is a revision of a standard college introductory text in dairying. The earlier editions of this text dealt chiefly with milk production. The present volume includes additional new chapters on butter making, ice cream making, cheese making, and miscellaneous dairy products. These chapters in a brief concise manner present manufacturing procedures, formulae, and typical computations related to producing a great variety of cultured and frozen milk products. The discussion on ice cream making is presented in detail.

The book as a whole can be said to be intended for students or others entering into dairying or the manufacture of dairy products. Although not specifically a work prepared for public health workers or those concerned with the sanitary supervision of milk and milk products, these workers may find it useful to have at hand the descriptions and discussions of the many processes and of the machines used in making milk products which this book contains.

SOI. PRNCUS

*Edith Cavell—By Helen Judson. New York: Macmillan, 1941. 288 pp. Price, \$2.50.*

Here is a timely book that will have great popular appeal, not because it is the story of a splendid nurse but because of the tragic end to her career as a zealous patriot.

It was George Bernard Shaw who referred to Edith Cavell as a heretic in his "St. Joan," thus provoking the curiosity of this author to learn more of the personality of the real woman known as a martyr to national patriotism. However, one gathers from the documentary evidence produced that it was not martyrdom but rather an overmastering desire to aid helpless humanity which stimulated her actions. In a last letter to a friend she wrote, "I want you to know I was neither afraid nor unhappy to give my life for England," and again to her pastor, "I have nothing to regret—if I had it to do over again, I would do just as I did."

Fortunately Miss Judson completed her research for this book in 1939, reading the last document but thirty-six hours before the outbreak of the Second World War. The evidence diligently accumulated permits her to write most convincingly of this extraordinary woman.

Over one-third of the book deals with those tragic events of 1915, ending with the death of Edith Cavell at the Tri National. The rest is devoted to the life and character of a great personality.

Historians previously have touched but lightly on the fact that the gentle, kindly, puritanical Englishwoman, Edith Cavell, was the founder of modern nursing in Belgium. At the request of Dr. Antoine DePage in 1907 she established the school now known as L'Ecole Edith Cavell—Marie DePage. From those early beginnings rapid advance was made and many notable women throughout the land have followed in her footsteps and given life to Belgium.



The story, serious and earnest, is well told, having an appreciation for minor humorous situations and making interesting reading while it makes a definite contribution to the history of nursing.

The dust jacket bears a reproduction of the bronze medallion on which appear the profiles and names of Edith Cavell and Marie DePage, the gracious wife of the blustering Dr. DePage who lost her life in 1915 on the *Lusitania*. One does not see the reverse side on which is cast the one word, "Remember." Its implication makes one agree with Miss Cavell that, "Patriotism is not enough." All must have patience and courage, but over and above, understanding of our fellowmen—at this time.

HAZEL A. GOFF

**Organization and Administration of Group Medical Practice** — By Dean A. Clark, M.D., and Katharine G. Clark. *New York: Joint Committee of the Twentieth Century and the Good Will Fund; and Medical Administration Service, Inc., 1941. 109 pp. Price, \$.25.*

Issued as one of a series of four pamphlets on the policies and procedures of group health plans, this 109 page booklet will be of interest to physicians and administrators concerned with the management of clinics in general. The authors studied fifteen clinics in different parts of the country. Some of these were connected with leading medical schools; others were private group clinics, the Mayo being one; still others were private, coöperative, or industrial clinics which supply all or part of their service on a prepayment basis.

Out of this experience there was formulated a set of principles and procedures for group medical practice which were previously published under the auspices of a committee of well known physicians. The pamphlet works out in detail the application of these principles in the day-to-day activities of clinics. It directs needed attention to the pro-

fessional, as distinguished from the financial and engineering aspects, of furnishing medical services through an organized group of physicians instead of through doctors working individually in private offices.

As the authors point out, the term "group medical practice" has been commonly applied only to private clinics of the Mayo type, but has a much wider application. The staffs of well organized hospitals and out-patient departments represent a large-scale and increasing area of group practice. An interesting section on appraising the quality of service merits attention, although it is only a beginning in a difficult field. Health departments are more and more involved in clinic services and in coöperation with hospitals and out-patient departments. From this point of view as well as from those of the hospital administrator and the clinician, this pamphlet is timely.

MICHAEL M. DAVIS

**The 1941 Year Book of Public Health**—*Edited by J. C. Geiger. Chicago: The Year Book Publishers, 1941. 544 pp. Price, \$3.00.*

Dr. Geiger has prepared a very excellent summary of the important contributions in the field of preventive medicine and public health for the year 1941. He has, in most cases, added an editorial comment of his own, expressing the opinion of one who has had long years of experience in the fields of public health administration and epidemiology.

The current year book is especially timely as it deals with the literature of many exotic diseases, which will increasingly become a concern of all health officers. With the movement of our troops into tropical and sub-tropical areas, new problems in communicable disease control immediately present themselves. All public health administrators should keep abreast with war problems as they arise, and in this *Year*

*Book* will be found short, concise and timely reviews of current literature.

This book should be on the desk of every public health worker who has administrative responsibilities.

HENRY F. VAUGHAN

**The Value of Health to a City—**  
*Two Lectures Delivered in 1873 by Max Von Pettenkofer, M.D., Translated from the German by Henry E. Sigerist, M.D. Baltimore: Johns Hopkins Press, 1941. 52 pp. Price, \$1.00.*

Great names in medical history are, for the most part, of men who have contributed greatly to the medical sciences. They are of anatomists, physiologists, pathologists or bacteriologists, who conducted research and made discoveries; or they are of physicians or surgeons who gave classical descriptions of diseases or performed great operations; or perhaps they are of men from related fields such as chemists, physicists, or biologists who contributed to the medical sciences.

There are, however, a few names of men who owe their places in history not to such specific deeds. Perhaps, and often, they were great scientists or physicians, but we do not know them primarily for their discoveries or scientific contributions. Certainly in this country our own Dr. Welch was such a physician; perhaps Hippocrates belonged in this group; indeed Pettenkofer was great beyond his scientific attainments.

It is difficult to state just why such men were great; just what they did to earn for themselves a place in history. But on this particular point we are greatly indebted to Dr. Sigerist for his translation of Pettenkofer's two Public Lectures given in 1873, entitled "The Value of Health to a City," which affords us an unusual view of the real caliber of the man. In this we see the breadth and scope of his vision; we see him viewing the sum total of disease and ill health in the whole community—

in the mass—and the toll it is taking; and we see him marshalling his forces, not only medical, but of all science, to control, to prevent disease. We see him striving for a proper place for health—for medicine—in the community, in the political economy. In fact we see Pettenkofer as a statesman, a medical statesman.  
J. S. CHAMBERS

**Refuse Collection Practice —**  
*By the Committee on Refuse Collection and Disposal. Chicago: American Public Works Association (1313 E. 60th St.), 1941. 659 pp., 221 ill., charts, tables. Price, \$5.00.*

This volume is the first comprehensive treatise on this important service published since 1921. It is the result of almost two years' research on the part of the Association and it presents an analysis and appraisal of refuse collection practice based upon information from 190 cities of the United States and Canada. The book also contains detailed tabulations of practices, cost data, a selected bibliography, and is completely indexed. ARTHUR P. MILLER

**Standard Methods for the Examination of Dairy Products** (8th ed.). *New York: American Public Health Association, 1941. 288 pp. Price, \$3.00.*

Laboratory workers concerned with milk and milk products already being thoroughly familiar with this volume, the reviewer addresses his comments to others who, like himself, are neither bacteriologists nor chemists but interested in milk sanitation and in broadening their mental horizons.

This edition is the culmination of at least 36 years of continuous study and effort by a gradually increasing group of workers for whom it has been a labor of love. Much of it, naturally, is too technical to be clear to readers not experienced in laboratory fields. The administrator, however, will be making

a mistake if he lays it aside on this account. He will find the historical introduction interesting and enlightening. Even the text covering technical matters is interspersed with information he should have concerning the use and limitations of various tests, and it is presented in simple and understandable language. The administrator should read it as he should his Bible, content to understand what he can.

The story opens, appropriately, with discussion of the bacteriological methods the development of which marked the beginning of progress in milk sanitation. It ends with the relatively new, epoch-making phosphatase tests. With proper conservatism these are held still to be tentative.

PAUL B. BROOKS

**Water Purification for Plant Operators—***By G. D. Norcom and K. W. Brown. New York: McGraw-Hill, 1942. 180 pp. Price, \$2.50.*

This is an instruction book which will serve to aid water purification plant operators to perform their routine duties. Requirements of a modern water supply and the various methods and steps in water purifications are covered. Other sections on records, the care of the plant, its equipment and appurtenances, and laboratory control add to the book's value. Briefly and simply, both theory and practice are discussed. Self-examination questions are to be found at the end of each chapter.

ARTHUR P. MILLER

**William Henry Welch and the Heroic Age of American Medicine—***By Simon Flexner and James Thomas Flexner. New York: The Viking Press, 1941. 539 pp. Price, \$3.75.*

One approaches the review of this book with considerable diffidence. Perhaps the task would be easier for a reviewer who had not known the subject.

For many years Welch was known as the dean of American Medicine. No

medical man had a wider acquaintance than he, and every younger man felt it was an honor to meet him. This volume then will be widely welcomed since it carries the story of one so widely known, so much admired, and so much loved personally.

The story of Welch's life carries surprises. Coming from a line of medical men, and the son of an old-time country doctor, it is strange to hear that Welch had no taste for medicine, and dreamed of being a professor of Greek. While at Yale he was filled with theological reasoning. Incidentally, at that time, 1866-1870, Yale had only eight full professors, and during Welch's sophomore year a "radical innovation"—a course in French—was introduced. In this atmosphere Welch showed religious inclination and was intimate with the theological students. However, he finally decided on medicine, and in 1872 entered the College of Physicians and Surgeons in New York. His interest in medicine was due more to the personality of some of his teachers than to the subject, and he attributed his subsequent interest in pathology to Seguin's lectures on nervous diseases. In 1875 he was graduated, and in April, 1876, he sailed for Europe on a "voyage of exploration." An endless scientific curiosity led him to many of the best teachers of the day, so that in 1878 he returned to America with a "revelation" which he passed on to America during the rest of his life.

Among the many laboratories visited was that of Theodor Kitt at the Veterinary School in Munich, where he was astonished at the abundance of material and learned much concerning diseases of animals, and especially those which were common to both man and animals. He seems to have been the first American doctor to realize the relationship between human and veterinary medicine. In spite of this, it appears that Welch was somewhat slow in recognizing the

importance of bacteriology, though in 1884 he expressed the opinion that for some years the relation of bacteria to disease would be the most important subject in pathology. Incredible, but only "after weeks of heart-rending negotiation" did Welch obtain a laboratory at Bellevue, with no resources for teaching bacteriology — barely enough for his courses in pathology. His great opportunity came when he accepted the professorship at Johns Hopkins University. There he was one of "The Big Four," immortalized as "The Four Doctors" in the famous painting by John Singer Sargent. There is little question that his influence in the formation of the Medical School at Johns Hopkins was predominant. He founded modern pathology in America on lines which he had brought from the great teachers of Europe, and excited a widespread interest in it, which still exists. Indeed the charge has been made, perhaps with a degree of truth, that the patient has been neglected in favor of the pathological aspects of his case. Osler was, of course, the dominant medical man and introduced methods of teaching which brought the student in direct contact with the patient, counteracting to a great extent the trend which emphasis on the purely scientific aspect of disease had engendered.

It would be impossible to write of Welch without including much of the history of the Johns Hopkins Medical School and Hospital. This of course brings in John S. Billings, who designed the buildings and who Welch considered one of the wisest men he ever knew.

Many other prominent men of that time are mentioned, but the story is of Welch, and there is much more that one would like to say about him than can be contained in a review.

The Rockefeller Institute for Medical Research, with its world-wide activities long had the benefit of his advice, and again he was a dominant figure in its

multiple activities. One thing which impressed him much in Germany was the hygienic institute in Munich, and this seemed, more than any other one thing, to awaken in Welch an interest in hygiene and public health, in which he was active throughout his life. When the first World War came Welch hurried to Washington and offered his services. Throughout he had a seat in the Surgeon General's office, and there is no doubt that the wise things done in the medical services of the Army were largely due to his influence and advice.

The campaign against antivivisection begun in 1890 occupied Welch's attention to a great extent. Between 1896 and 1900 the antivivisectionists were rampant and in the Senate they had an advocate in Senator Jacob H. Gallinger, of New Hampshire, a homeopath of the old school. Welch gave up much of his time to fighting this legislation. W. W. Keen, of Philadelphia, another great man who was active in this fight, deserves much credit which is not given.

Any biography of Welch must give, as this does, much of the histories of his various activities. In addition to his work in the Johns Hopkins Medical School and Hospital and the Rockefeller Foundation, he played a large part in the service of the Red Cross, taking part in the Conference at Cannes in 1919. He had a great love for the history of medicine, and brought about the foundation of the Welch Memorial Library, buying books for which he spent many months in Europe. He founded the Johns Hopkins School of Hygiene and Public Health, was on innumerable boards and commissions, and was called upon for advice in many other ways.

There are Appendices, giving lists of the organizations to which he belonged, and honors bestowed. The book is well documented, some 59 pages being given to references. Throughout, the English spelling of words like connexion, colour,

favour, etc., is used. This is not in accordance with the best American usage.

Only a few personal remarks can be made, though one would like to speak much more of a man who was so universally loved. He was an early advocate of the historical method of teaching. As he expressed it, "the best line of approach to whatever subject he is teaching is really the historical one, not to formulate the existing line, but rather the way knowledge came to be." Another great teacher, Victor Vaughan, held almost identical ideas. Welch liked the German method of teaching and expressed the opinion that "students in American medical schools suffered from overteaching." Spoon-fed pupils seldom develop originality or scientific backbone. Welch did service in standing for correct English, and in his editorial work would frequently cut a paper to pieces, only to find sometimes that the ignorant author would change everything back to its incorrect form. Until very late in life, indeed only when he was in the hospital during his last illness, did he learn the use of a secretary. There exists a voluminous mass of correspondence in longhand. How he accomplished it all is a wonder. He did not write out addresses, but often appeared with a number of sheets, apparently manuscript, though only the top page would show a few notes. His language was exact and fluent. He never failed to hold his audience and to give the meat of a subject. His good nature and kindness led him into errors. When having promised some favor he could not conscientiously carry out, he put the matter out of his mind, and did not answer letters or even telegrams concerning the matter. When tackled by the unfortunate who did not receive the favor promised, he would, with his disarming smile, blame it on his absent-mindedness. There is reason to believe that he carried this somewhat further than is told in the book.

Altogether, this biography is an unusually intimate one. There were many contradictions in the life of Welch. In spite of his being a delightful companion, welcomed at every meeting, scientific or social, in spite of the delightful dinners he gave at the Maryland Club and elsewhere, his own letters show that he was often lonesome. He had no confidant except his sister. These facts are recognized by the authors, as shown by the closing sentence of the book: "Popsy, the physician who had been so greatly beloved, died as he had lived, keeping his own counsel, essentially alone." MAZÛCK P. RAVENEL

Stitt's *Diagnosis, Prevention and Treatment of Tropical Diseases*—By Richard P. Strong, M.D. (6th ed.). Philadelphia: Blakiston, 1941. 2 Vols., 1747 pp. Price, \$21.00.

The timely appearance of a new edition of this standard American textbook on Tropical Diseases is particularly welcome to all who are interested in this field of medicine, which is so important to our national defense in the present war. No happier selection of an editor by Admiral Stitt could have been made than the Professor Emeritus of Tropical Medicine of Harvard University, who has been a leader in so many of the advances in this field during the past forty years. With the coöperation of members of the Department of Tropical Medicine at Harvard, as well as members of the Army and Navy Medical Corps and other American authorities, Admiral Stitt's book has been almost entirely rewritten and has been expanded to meet present needs and to include prevention as the present title indicates.

Volume I contains sections on diseases due to protozoa and to bacteria; Volume II contains sections on diseases caused by filtrable viruses, rickettsiae and allied organisms, on nutritional disorders, on other miscellaneous diseases

such as heat stroke and heat prostration, tropical ulcers, granulomas and other skin diseases, and psychoses; diseases due to fungi and poisonous plants and diseases caused by helminths, arthropods and other poisonous animals. There is also a section on Medical Practice in the Tropics and Cosmopolitan Diseases, and an Appendix containing sections on Clinical Diagnosis, Laboratory Procedures and Hygiene in the Tropics. The work is profusely illustrated with colored plates, photographs, line drawings, maps and charts. Each chapter is followed by a list of important references and there is a complete index. The work is excellently printed on glossy paper but is rather lightly bound for the heavy use which it is likely to receive. Its length and cost are well compensated for by the breadth of its treatment of this field of medicine in which so many important recent advances have been made. It should be in the possession of every medical and public health library, every teacher of medicine and public health, every medical unit of the armed forces, and every physician and scientist interested in the field of tropical medicine.

HENRY E. MELENEY

**Attention to Your Health**—By Ernest I. Stewart, Jr. New York: Bureau of Publications, Teachers College, Columbia University, 1941. 82 pp. Price, \$.35.

Common facts about personal health as applied to life in the Army are presented in understandable form in this handbook. It is the second of three pamphlets prepared to assist young men in anticipation of selection into military service. Under twenty-five chapter headings, beginning with Your Health, ending with Off Duty, and including Eating Out, Sniffles and Sneezes, Venereal Disease Facts, and the Eyes Have It, the author succeeds in bringing together in concise form a wealth of information much of which may be new

to a recruit and all of which is worthy of review by him. The preparation of the book was sponsored by the National Committee on Education and Defense of the National Education Association and the American Council on Education in coöperation with the Pre-Induction Education Committee of Teachers College, Columbia University.

IRA V. HISCOCK

**Keeping Safe and Well**—By C. E. Turner, Frances W. Clough, and Grace Voris Curl. Boston: Heath, 1941. 214 pp. Price, \$.72.

**Growing Up**—By C. E. Turner and Grace T. Hallock. Boston: Heath, 1941. 216 pp. Price, \$.72.

These two books are a part of a new six book health series for grades 3 to 8. Like their predecessors, the *Malden Health Series*, they incorporate many of the principles resulting from experimental studies in health education made by the authors.

Using the story approach, the authors take their readers on trips which bring out a host of meanings of importance in health education. What youngster, for example, could fail to enjoy the delightful story associated with the "Pet Show," or thrill at the prospect of observing biological "Friends and Enemies" as seen through the magnifying glass. The authors have succeeded not only in telling their stories well but, more important, they have managed to integrate problems of health and safety into ordinary life situations without making it appear obvious. Subject matter has been organized entirely on a unit basis.

These books are nicely bound, attractively prepared, authentic, and well illustrated. Of especial value to the teacher is the inclusion of a list of additional books—"Stories to Read"—which may be needed to supplement their contents. The incorporation of a list of "Words to Know" is most commendable.

The reviewer recommends these books very highly. They will undoubtedly take their place alongside of other successful contributions of their kind made by the authors in recent years.

EARL E. KLEINSCHMIDT

*The American and His Food—By Richard Osborn Cummings. Chicago: University of Chicago Press, 1940. 267 pp. Price, \$2.50.*

While working on a history of the American ice industry and the development of refrigeration, Professor Cummings sought, but was unable to find, a systematic account of food habits during the past century. His book was written to make good this deficiency. Beginning with food on the farm and menus in the city in 1789, when city dwellers, like country folk, suffered from the lack of milk, fresh fruits, and vegetables, he carries the record through to 1940 when federal feeding programs reached their highest development in school lunches, the food stamp plan, and the distribution of cheap milk. The chapter on "Waging a War (1917–1929)" is of particular interest at the present time, for as the war of 1914–1918 helped many in this country to achieve a more balanced diet, so the present war may greatly speed progress toward the goal of diets adequate for health for the lower income groups. Professor Cummings deals throughout with the influence of social and technological forces on the national diet. He describes current advances in the science of nutrition in a running commentary which serves the reader as a useful frame of reference. His book is no mere compilation of data, but an attempt to appraise and to explain factors which were responsible for deficiencies and improvements in the diets of the American people. The book is pleasantly written, not without elements of humor, and gives evidence of wide and critical reading. I found the earlier

chapters more absorbing than those dealing with the postwar years, but this may be accounted for by the difficulty for reader as well as author of viewing current events in proper perspective. Professor Cummings's own point of view is illustrated by the following quotation: "The science of nutrition may be said to have advanced to the point where it is firmly established not only as a branch of preventive medicine but as a major instrument of social policy" (page 230).

This book may be recommended to physicians, health workers, nutritionists, nurses, and intelligent readers of all classes.

There are some interesting illustrations and a good index.

FRANK G. BOUDREAU

*Community Hygiene—By Smiley and Gould. (3rd ed.) New York: Macmillan, 1941. 448 pp. Price, \$2.50.*

Streamlined, abreast of the times, and supported by well chosen and in most instances, modern illustrations, the 1941 revision of *Community Hygiene* by Smiley and Gould will be valued by public health students and workers alike. The general field is well covered, the basic information is accurate, and the method of presentation is attractive. Bibliographies reflect careful choice.

The section on sanitary significance of the soil emphasizes in a new way the nitrogen cycle and portrays the soil as man's most efficient scavenger. Other sections, including the relationship of weather to health, the public health aspects of heart disease and cancer, industrial health, and the economics of health are indicative of the broad scope of the discussions.

The section on tuberculosis emphasizes eradication rather than control and indicates the value of mass x-ray-ing, but the value of examining the contacts of positive tuberculin reactors is

omitted. We in the West also feel that standards set for "approved milk" are not indicative of clean production methods and should not be exemplified.

The few minor criticisms which can be supported only serve to highlight the major importance of this excellent book.

WILTON L. HALVERSON

**Functional Health Teaching Syllabus**—By *Hynda M. Weber*. New York: Ginn, 1941. 165 pp. Price, \$1.75.

This report from the Committee on Functional Reorganization of Secondary School Curricula of the North Central Association of Colleges and Secondary Schools describes a 3 year experiment in teaching health to students in 8 high schools in Illinois and 1 in Wisconsin. It presents the kind of material that teachers of hygiene and health-minded science teachers are always looking for and never finding. For, after describing the objectives and procedures followed by the 9 schools in developing their *functional* health course, 9 teaching units are completely outlined. Each unit contains subject matter outlines for the teachers and a list of problems for students to solve.

The different informal methods used to evaluate the project will be of interest to the measurement-minded person. To the administrator and educator, however, the results agreed upon,

at a general conference held during the third year, will have greater significance. Representatives from the 9 schools subscribed to the following facts: That the functional health education classes were of more interest to students than regular biology or general science courses; that the influence of the functional emphasis had permeated the teaching of other classes; that coöperation had been promoted between the sciences, home economics, physical education, and medical work. Other recommendations favored making health training an all-school and a community project. Several schools had plans made for correlating health teaching with the social studies.

Faced with organizing a course such as this, certainly educators would agree neither on the main topics nor on the subject matter under each topic. This reviewer found herself reading the sections on posture and mental hygiene most critically. The fact remains, however, that here in print is a record of an experiment that puts into practice something health educators are always talking about but never quite succeeding in doing. Life problems are selected for study; the various sciences contribute the teaching of principles necessary to explain the problem; practising new knowledge in daily living builds up new values and habits.

DOROTHY B. NYSWANDER



## BOOKS RECEIVED

- INDUSTRIAL WASTE TREATMENT PRACTICE. By E. F. Eldridge. New York: McGraw-Hill, 1942. 401 pp. Price, \$5.00.
- INDUSTRIAL SURGERY. PRINCIPLES, PROBLEMS AND PRACTICE. By Willis W. Lasher. Enl. First Edition. New York: Hoeber, 1942. 472 pp. Price, \$6.50.
- A HISTORY OF MEDICAL PSYCHOLOGY. By Gregory Zilboorg. New York: Norton, 1941. 606 pp. Price, \$5.00.
- ANOXIA. ITS EFFECT ON THE BODY. By Edward J. Van Liere. Chicago: University of Chicago Press, 1942. 269 pp. Price, \$3.00.
- TUBERCULOSIS IN INDUSTRY. Saranac Laboratory Symposium. Leroy U. Gardner, Editor. New York: National Tuberculosis Association, 1942. 374 pp. Price, \$3.00.
- HISTORY OF THE ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES. By Edgar Erskine Hume. Washington: Association of Military Surgeons, 1941. 371 pp. Price, \$2.00.
- SOURCE BOOK OF MEDICAL HISTORY. Compiled by Logan Clendening. New York: Hoeber, 1942. 685 pp. Price, \$10.00.
- NEURAL MECHANISMS IN POLIOMYELITIS. By Howard A. Howe and David Bodian. New York: Commonwealth Fund, 1942. 234 pp. Price, \$3.50.
- STEDMAN'S SHORTER MEDICAL DICTIONARY. By Thomas Lathrop Stedman. Chicago: American Publishers Association, 1942. 635 pp. Price, \$2.50.
- NURSING. A COMMUNITY HEALTH SERVICE. By Amelia Howe Grant. Philadelphia: Saunders, 1942. 277 pp. Price, \$2.50.
- MENTAL HYGIENE FOR COMMUNITY NURSING. By Eric K. Clarke. Minneapolis: University of Minnesota Press, 1942. 262 pp. Price, \$3.50.
- HEATING, VENTILATING, AIR CONDITIONING GUIDE, 1942. American Society of Heating and Ventilating Engineers. 20th ed. 1136 pp. Price, \$5.00.
- SUPERIOR CHILDREN THROUGH MODERN NUTRITION. By I. Newton Kugelmass. New York: Dutton, 1942. 332 pp. Price, \$3.50.
- FROM INFANCY THROUGH CHILDHOOD. By Louis W. Sauer. New York: Harper, 1942. 200 pp. Price, \$2.00.
- HOW TO FEEL BETTER AND LOOK IT. By Frank T. Kimball and Abbott W. Allen. New York: Duell, Sloan & Pearce, 1942. 280 pp. Price, \$2.50.
- VITAL STATISTICS OF THE UNITED STATES 1939. Part I. Natality and Mortality Data for the United States Tabulated by Place Occurrence with Supplemental Tables for Hawaii, Puerto Rico, and the Virgin Islands. Price, \$1.50.
- VITAL STATISTICS OF THE UNITED STATES 1939. Part II. Natality and Mortality Data for the United States Tabulated by Place of Residence. Price, \$1.25.
- Prepared under the Supervision of Halbert L. Dunn, M.D. Washington: Government Printing Office, 1941.
- OUTWITTING THE HAZARDS. YOUTH ATTACKS THE ACCIDENT PROBLEM. By Francis L. Bacon. New York: Silver Burdett Co., 1941. 446 pp. Price, \$1.80.
- MODERN BREAD FROM THE VIEWPOINT OF NUTRITION. By Henry C. Sherman and Constance S. Pearson. New York: Macmillan, 1942. 118 pp. Price, \$1.75.
- MANUAL FOR TEACHING MIDWIVES. By Anita M. Jones. Children's Bureau Publication No. 260. Washington: Government Printing Office, 1941. Price, \$30.
- HIDDEN HUNGERS IN A LAND OF PLENTY. Washington: National Maternal and Child Health Council, 1941. Price, \$25.
- FOOD VALUES OF PORTIONS COMMONLY USED. Bowes & Church. Philadelphia: Anna de Planter Bowes. 4th ed. 1942. 35 pp. Price, \$1.00.
- DETERMINING WORKS LOADS FOR PROFESSIONAL STAFF IN A PUBLIC WELFARE AGENCY. By Herbert A. Simon, William R. Divine, E. Myles Cooper and Milton Chernin. Bureau of Public Administration, University of California, Berkeley, 1941. 94 pp. Price, \$1.00.

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**Fitter to Fight**—This preview of the probable mortality statistics for 1941 is reassuring. Despite increasing birth rates, greater accidental and industrial death rates, there is promise of a 1941 mortality rate lower than in 1940. Few will question the heartening conclusion that we are entering this war in far better health than we did the last.

ANON. Mortality Record for 1941. Statistical Bull. (Metropolitan Life Ins. Co.) 23, 1:1 (Jan.), 1942.

**Children Still Die from Diphtheria**—Of the 93 cities represented in the annual compilation of needless diphtheria deaths, 40 had none. The rate for all, for the second time, is less than 1.0, and the actual number of deaths declined from 330 to 229. This is a remarkable record concludes the survey. But 229 are still 229 too many.

ANON. Diphtheria Mortality in Large Cities of the United States in 1940. J.A.M.A. 118, 9:714 (Feb. 28), 1942.

**An Index of Obesity**—Proposed here is a new classification of overweightedness on the basis of specific gravity. The procedure includes dunking the subject, tastefully attired in a lead belt. When the air is expelled from his lungs he is weighed while still under water. Then he is weighed on dry land. The two weights when used in a prescribed formula provide a really accurate measure of the body fat. The line dividing the pudgy from the scrawny is 1.060.

BEHNKE, A. R., JR., *et al.* The Specific Gravity of Healthy Men. J.A.M.A. 118, 7:495 (Feb. 14), 1942.

**Respiratory Infections: Air Borne or Contact?**—Little is definitely settled

about the manner in which respiratory infection viruses are spread, but the hypothesis that they are largely air-borne stands up better than the theory that they are spread chiefly by direct contact. The discussion of the three principal lines of research upon which this conclusion is based is long and involved but well worth your serious study.

BUCHBINDER, L. The Transmission of Certain Infections of Respiratory Origin. J.A.M.A. 118, 9:718 (Feb. 28), 1942.

**The Eye in Public Health**—Does the hygiene of the eye impinge ever so remotely upon your own little public health activity? Then you'll be interested in this series of six papers. Plato's quotation, "You can't cure the eye without healing the head, nor the head without healing the eye," sets the pace.

GALDSTON, I. The Society's Conference and What It Indicates for the Future (and five related papers). Sight-Saving Rev. 11, 4:251 (Dec.), 1941.

**Just for the Record**—Here is another study—by unimpeachable authority—indicating that the progress of caries in children can be substantially reduced by an intensive educational program in nutrition. Let's hope this matter remains settled, one way or the other.

HOWE, P. R. The Influence of Nutritional Supervision on Dental Caries. J. Am. Dental Assoc. 29, 1:38 (Jan.), 1942.

**Industrial Hygiene and War Production**—Despite all the fine scientific formulae, the work output of a human being is difficult to measure, and the problems of resulting fatigue are too subtle to yield to physiologic tests. But the experienced industrial hygienist

knows some rule of thumb combinations of rest, recreation, and good food that improve physical and mental fitness.

N.B. The lion's share of this issue is given over to formal papers and reports of discussions from the Fourth Annual Congress of Industrial Health. They are far too numerous to be listed separately here, but they are all of great moment to public hygienists. Hence you are adjured to seek them out and to digest them thoroughly.

Ivy, A. C. The Physiology of Work. J.A.M.A. 118, 8:569 (Feb. 21), 1942.

**To End the Discussion—**Claims that gelatin increases endurance are unfounded.

KING, E. Q., *et al.* Failure of Aminoacetic Acid to Increase the Work Capacity of Human Subjects. J.A.M.A. 118, 8:594 (Feb. 21), 1942.

**Replacing the Village Health Board—**Seventy per cent of us Americans are now living under some kind of a full-time local health administration. Defense areas are stimulating the creation of this essential service for some of the benighted 30 per cent. For a picture of the administrative set-up of our country see this report.

KRATZ, F. W. The Present Status of Full-time Local Health Administration. Pub. Health Rep. 57, 6:194 (Feb. 6), 1942.

**Reassurance for Troubled Days—**In Britain, war has accelerated the progress of the health services. Attention to nutrition and cessation of unemployment more than counterbalance the inevitable ill effects of war's preparations. Let us hope history repeats itself on this side of the water.

MAC GREGOR, A. The Public Health Services in the War. Pub. Health 55, 4:81 (Jan.), 1942.

**Cancer's Habits—**Skin cancer rates in three southern cities averaged 140; in three northern cities they were under 30. Most cases were among males and almost exclusively whites. There is much

more in this statistical study to provide a toothsome cud for mental rumination.

McDOWELL, A. J. The Incidence of Cancer in Dallas and Fort Worth, Tex., and Surrounding Counties, 1938. Pub. Health Rep. 57, 4:125 (Jan. 23), 1942.

**It Can Happen Here, Too—**Heartening indeed is this report upon the care of the numerous casualties from the attack upon Pearl Harbor. The operative experience upon the very large number of seriously wounded was far better than in the World War, chiefly because of the early care given, preliminary shock treatment, adequate debridement, and the use of sulfonamide drugs.

MOOREHEAD, J. J. Surgical Experience at Pearl Harbor. J.A.M.A. 118, 9:712 (Feb. 28), 1942.

**Public Health in War-time—**Twenty top-notch articles on public health by a galaxy of the country's leaders—Armstrong, Boudreau, Cabot, Davis, Edie, Eliot, Emerson, Frant, Haggard, Heiser, Holland, Lindeman, McCloskey, Myerson, Parran, Perrott, Rice, Roberts, Snow, Whipple, Wile, and Winslow. It would be fruitless to attempt to comment on this excellent series here for you will want to preserve the whole collection in your reference files.

C.-E. A. WINSLOW, *et al.* Fitness for Freedom. Survey Graphic 31, 3 (Mar.), 1942. \$.40 single copy, \$1.00 for four copies, \$.20 a copy in thousands.

**Nutrition and Resistance to Infection—**White mice on a diet deficient in riboflavin or thiamin were more susceptible to intranasal inoculation with pneumococci than were mice on an adequate diet, but the daily feeding of 5 to 10 times the amounts of these vitamins to the deficient animals after infection didn't do any good.

WOOLEY, J. G., and SEBRELL, W. H. Nutritional Deficiency and Infection. Pub. Health Rep. 57, 5:149 (Jan. 30), 1942.

## ASSOCIATION NEWS

### SEVENTY-FIRST ANNUAL MEETING

ST. LOUIS, MO., OCTOBER 27-30, 1942

*Headquarters*

MUNICIPAL AUDITORIUM

### APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

#### *Health Officers Section*

John A. Kahl, M.D., M.P.H., 636 South Palouse St., Walla Walla, Wash., City-County Health Officer

Elmer C. Kefauver, M.D., 209 East Second St., Frederick, Md., City-County Health Officer

James S. May, M.D., Allen Parish Health Unit, Oberlin, La., Director

William David May, M.D., Lauderdale County Health Dept., Meridian, Miss., Asst. Director

John G. Norris, M.D., 1112 Jackson St., Apt. 5, Monroe, La., Director, Caldwell Parish Health Unit

Joseph M. Silagy, M.D., 36 Eastway, Greenbelt, Md., Director of Public Health

Edgar W. Warren, M.D., 502 E. & Victor St., Abbeville, La., Director, Vermilion Parish Health Unit

#### *Laboratory Section*

Edwin H. Albano, M.D., 144 Harrison St., East Orange, N. J., Director, Pathological Laboratories

Alexander I. Erasmus, 4238 Heather Rd. (Lakewood Village), Long Beach, Calif., Pharmacist's Mate, Medical Dept., U. S. Navy

Mattie Pearl Henderson, M.S., 309 Market St., Knoxville, Tenn., Acting Director, City and State Branch Laboratory

Frank L. Horsfall, Jr., M.D., C.M., E. 66th St. & York Ave., Rockefeller Institute, New York, N. Y., The Hospital of the Rockefeller Institute for Medical Research

John A. Layne, M.D., 410 Central Ave., Great Falls, Mont., Division of Medicine, Great Falls Clinic

Frank E. Lescanec, B.A., Clarke-Wayne County Health Dept., Shubuta, Miss., Sanitation Supervisor

Milton L. Lewis, M.S., P. O. Box 235, U. S. Submarine Base, Coco Solo, Canal Zone, Bacteriologist, U. S. Navy

Martha E. McGilvray, Dixon State Hospital, Dixon, Ill., Junior Bacteriologist, State Dept. of Public Welfare

Ruth E. Miller, Ph.D., Woman's Medical College of Pennsylvania, Philadelphia, Pa., Bacteriologist

John A. Pence, B.S., Sanitary Milk Co., Rantoul, Ill., Dairy Bacteriologist

#### *Vital Statistics Section*

Bernard D. Karpinos, Ph.D., National Institute of Health, Bethesda, Md., Assoc. Economist

Blanche C. Knight, B.A., City Hall Annex, Berkeley, Calif., Statistician, Berkeley Health Dept.

Ben H. Sklar, M.S.P.H., 603 Fountain St., Ann Arbor, Mich., Statistician, Michigan Dept. of Health, Bureau of Epidemiology

#### *Engineering Section*

Selwyn T. Chalker, Jr., B.S., P. O. Box 75, Hinesville, Ga., Sanitarian, Liberty County Health Dept.

J. Frank Field, B.S., 203 Golf Club Lane, Nashville, Tenn., Chief Sanitary Engineer, State Dept. of Public Health

George F. McKenzie, Mason County Health Dept., Maysville, Ky., Sanitary Inspector

Fred L. Moesel, Sanitary and Water Supply Engineer, Princeton Junction, N. J.

Howard E. Munro, Bahamas General Hos-

pital, Nassau, Bahamas, Sanitary Inspector,  
Public Health Dept.  
Laban M. Poston, City Hall, Borger, Tex.,  
City Inspector, City Health Dept.  
Reeve Lee Sensabaugh, B.S., City Hall, Mus-  
kegon, Mich., Supt. of Water Supply, City  
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#### *Industrial Hygiene Section*

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#### *Food and Nutrition Section*

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#### *Maternal and Child Health Section*

Francis I. Livingston, D.D.S., M.S.P.H., Smith  
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#### *Public Health Education Section*

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Research Institute  
Edith M. Lindsay, M.A., Mills College, Oak-  
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Robert C. Miller, Ph.D., Calif. Academy of  
Sciences, San Francisco, Calif., Museum  
Director  
John R. Nichols, Ph.D., Univ. of Idaho,  
Pocatello, Ida., Executive Dean  
Claude C. Pierce, M.D., Sub-Treasury Bldg.,

15 Pine St., New York, N. Y., Director,  
U. S. Public Health Service District 1  
Stella Randolph, M.A., 5848 University Ave.,  
Chicago, Ill., Student, Chicago University  
Ethel L. Sherman, R.N., Crowley County  
Public Health Nurse, Ordway, Colo.  
Joseph L. Stenck, 128 W. 74th St., New York,  
N. Y., Asst. Director, in Charge of Publicity,  
American Social Hygiene Assn.  
Dr. Miguel Velve, Yabucoa, Puerto Rico,  
Clinic Physician  
Marian D. Williamson, R.N., 301 Heyburn  
Bldg., Louisville, Ky., Director, The Ken-  
tucky Crippled Children Commission

#### *Public Health Nursing Section*

M. Patience Carr, R.N., M.A., State Dept.  
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Nurse, U. S. Public Health Service  
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R. I., Director of Nurses, Visiting Nurse  
Assn.  
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Miami Beach, Fla., Public Health School  
Nurse  
Ethel M. Russell, 1933 Crafton Blvd., Craf-  
ton, Pa., Supervisor of Public Health Nurses,  
Pittsburgh Public Health Nurses Assn.  
Vilma Schuster, B.S., 909 North Missouri,  
Roswell, N. M., Regional Public Health  
Nursing Consultant, State Dept. of Public  
Health  
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Nurse Assn.  
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St., Knoxville, Tenn., Supervising Nurse,  
Venereal Div., Bureau of Health  
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Alberta B. Wilson, R.N., C.P.H., 8 The  
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Health Nursing, State Board of Health

#### *Epidemiology Section*

Ludwik Anigstein, M.D., Ph.D., School of  
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Assoc. in Preventive Medicine and Public  
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St., Chicago, Ill., Epidemiologist, Chicago  
Dept. of Health

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Gerald A. Heidbreder, M.D., M.P.H., Civic Center, Room 0132, San Diego, Calif., Medical Officer, Dept. of Public Health, Bureau of Venereal Disease Control

Philip H. Narodick, M.D., 307 Cobb Bldg., Seattle, Wash., Supt. and Medical Director, King Co. Tuberculosis Hospital

Dr. Francisco Ruiz-Sanchez, Hidalgo 73 Pte., Culiacan, Sinaloa, Mexico, Chief Epidemiologist, Sanitary Service

Thamara M. Stander, M.D., M.S.P.H., 28 Belmont Parkway, Hempstead, N. Y., Junior Epidemiologist, Nassau County Dept. of Health

#### *Unaffiliated*

Melbourne Murphy, M.S.P.H., 1022 Granger, Ann Arbor, Mich., House Manager, University Health Service

Simon Noe Jaime, M.D., Rosales 20-206, Mexico, D. F., Mexico, Student, National University of Mexico

Martha M. Penfield, 156 Maple Street, Englewood, N. J., Interested Citizen

#### DECEASED MEMBERS

Mrs. Catherine R. Athey, Boise, Ida., Elected Member 1920—Unaffiliated

Thomas F. Birmingham, M.D., Galesburg, Ill., Elected Member 1937, Health Officers Section

Henry C. Brown, M.D., San Jose, Calif., Elected Member 1923, Health Officers Section

Ruth L. Conrad, Altadena, Calif., Elected Member 1935, Public Health Education Section

George Fordham, M.D., C.P.H., Powellton, W. Va., Elected Member 1926, Elected Fellow 1930, Industrial Hygiene Section

Carlos Manuel Garcia, M.D., Habana, Cuba, Elected Member 1936, Laboratory Section

Merrill J. Mack, Amherst, Mass., Elected Member 1928, Elected Fellow 1933, Food and Nutrition Section

Felix Seligman, Duluth, Minn., Elected Member, 1934, Engineering Section

Mary B. Willeford, Ph.D., R.N., Washington, D. C., Elected Member 1939, Public Health Nursing Section

#### AMERICAN MUSEUM OF HEALTH

THREE new members join the Board of Directors of the American Museum of Health for its first regular meeting in 1942 on April 27. The new Directors, elected at the Fifth Annual Meeting of the Museum in January are: John A. Marcuse, Basil O'Connor, and Edwin A. Salmon. Mr. O'Connor was elected Treasurer of the Museum.

The annual report of George McAneny, President, and Dr. Louis I. Dublin, Chairman of the Board, indicated that negotiations were proceeding toward the establishment of the Museum in a wing of the American Museum of Natural History. Preliminary studies for the necessary construction work entailed in this move have been authorized by the City Planning Commission, according to Commissioner Salmon, and James A. Dawson, representative of Commissioner of Parks Moses on the Museum's Board.

Over 300,000 people have seen the Museum's exhibits since the close of the Fair, according to the report of

Homer N. Calver, Secretary. Through its exhibit loan program Museum materials were displayed by 14 organizations in 12 cities during the past year. He also announced the forthcoming publication of the first report on the Visitor Reaction Study, conducted by the Museum and the U. S. Public Health Service, under a grant from the Carnegie Corporation of New York. The report, *What the Public Knows About Health*, comprises a compilation of the results of the Health Knowledge Tests given at the New York World's Fair and the San Francisco Golden Gate Exposition.

#### TWO NEW A.P.H.A. SECTION SECRETARIES

THE Vital Statistics Section Council has elected Hugo Muench, Jr., M.D., to serve as the Acting Secretary of the Section to replace John Collinson, M.D., who has resigned.

The Public Health Education Section Council has elected W. W. Bauer, M.D., Acting Secretary of the Section to replace Hugh R. Leavell, M.D., who has resigned.

## EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York, N. Y.

### U. S. CIVIL SERVICE COMMISSION

The Commission has announced that applications will be received for positions as Senior Medical Officer (\$4,600), Medical Officer (\$3,800), and Associate Medical Officer (\$3,200) for appointments in the Public Health Service, with the Food and Drug Administration, Veterans' Administration, and the Indian Service. Forms for application may be obtained from the U. S. Civil Service Commission, Washington.

The Commission has announced unassembled examinations for Junior Public Health Nurse at \$1,800 a year and Junior Graduate Nurses at \$1,620 a year, under which the training and age requirements of announcements No. 88 and 103 of 1941 have been amended. Persons interested should communicate with the U. S. Civil Service Commission in Washington or obtain the amended announcements at any first or second class post office.

The Commission announces unassembled examinations for Home Economists in 5 different grades at \$2,600 to \$5,600 a year. Interested persons should apply to the Commission for *Circular 195* on Home Economics.

### PHYSICIANS NEEDED IN CANAL ZONE

The U. S. Civil Service Commission announces an examination to secure physicians for clinical service in the Panama Canal Zone. Graduation from a class A medical school subsequent to May 1, 1920, is required, and the applicant must be under 50, 25 to 35 years of age preferred. Entrance salary \$4,000. Persons interested should communicate with the U. S. Civil Service Commission, Washington.

### WYOMING MERIT SYSTEM COUNCIL

The Wyoming Merit System Council announces unassembled examinations for positions in the field of Maternal and Child Health, Dental Hygiene, Health Education, Public Health Nursing, Physical Therapy, Medical Social Work, Public Health Engineering, Epidemiology, County Health Administration, Vital Statistics, and Public Health Laboratory. Also written examinations in Public Health Nursing, 5 grades, Sanitarian and Laboratory Technician, 2 grades.

It is expected that applications can be filed until April 18. Copies of announcement and application forms may be secured from the Wyoming Merit Supervisor at Newcastle, Wyo. Wyoming residence waived.

### POSITIONS AVAILABLE

Western state department of health will consider applications from physicians to fill four existing vacancies among county health officers, one vacancy in venereal disease control and positions as laboratory technicians. Write Box S, Employment Service, A.P.H.A.

County Public Health Nurses for New Mexico. Must have four months' post-graduate instruction under one of the recognized public health nursing courses and one year's experience. Must drive and have a car. Address inquiry to State Health Department, Santa Fe, N. M.

Physician with either public health training or experience in local health de-

partment administration to serve as health director in a county health department in mid-western state. Salary \$4,000 and \$500 travel (flat rate). Well established department with offices in attractive little city of 10,000. Write Box T, Employment Service, A.P.H.A.

Wanted: Trained Public Health Nurse, starting salary \$1,500 per year and traveling expense, increase to \$1,620 within 6 months. Saginaw County Health Dept., Saginaw, Mich.

The State Department of Social Security and Welfare, Crippled Children's Division, of Phoenix, Ariz., has three vacancies to be filled. Examinations will

soon be held for orthopedic nursing consultant, nurse-physical therapist, and medical social worker.

Further information may be obtained by writing to the Merit System Supervisor, Room 208, 128 North First Avenue, Phoenix, Ariz.

The New Mexico State Department of Health will consider applications for position of Obstetrical Consultant for Demonstration Unit in Maternal and Child Health. Address inquiries to State Department of Public Health, Santa Fe, New Mexico.

The New Mexico State Department of Health will consider applications for the position of Nutrition Consultant. Address inquiries to State Dept. of Public Health, Santa Fe, New Mexico.

#### PUBLIC HEALTH ENGINEER

Responsible professional public health engineering involving field investigations and office studies in the application of sanitary measures. The more difficult engineering and sanitation field surveys include supervision over public water supplies, sewerage systems and sewage treatment plants and review of plans for same, and promotion and supervision of sanitation programs. Minimum qualifications: Training and experience equivalent to 3 years' civil engineering experience, including 2 years in public health or sanitary engineering; or completion of an academic year of graduate study and a year's experience in sanitary or public health engineering; and graduation from a college of recognized standing with a major course in civil or sanitary engineering. The salary range is \$205 to \$250 per month depending upon experience. Apply Box E, Employment Service, A.P.H.A.

#### OTHER VACANCIES

Southwestern State Health Department seeks 2 physicians for assignment to district health units, personally to conduct several small venereal disease clinics on

a rotating schedule. Experience preferred but not required. Salary \$3,000, plus actual travel allowance not to exceed \$1,200. Write Box V, Employment Service, A.P.H.A.

Middle western city, 125,000 population, seeks well trained and experienced Health Officer on full-time, with competence to administer a department and teach public health to medical students. Salary \$5,000 to \$5,500 per annum. Write Box K, Employment Service, A.P.H.A.

The New Mexico State Department of Public Health will consider applications for the position of Assistant Director of the Maternal and Child Health Division and for Dental Health Consultant of that Division. Address inquiries to the State Department of Public Health, Santa Fe, N. M.

Bacteriologist, M.S. or Ph.D., with 3-5 years' applied experience in the field of sanitation and disinfection wanted by prominent eastern manufacturer for research and development work. Creative ability must be established. Consideration will be given only to those who fully meet the above requirements. In replying give full academic record, scientific and personal references, and recent photograph will be requested. Write Box P, Employment Service, A.P.H.A.

Wanted: Trained Public Health Nurse, starting salary \$1,500 per year and traveling expenses. Increase may be expected within 6 months. Shiawassee County Health Department, Corunna, Mich.

Wanted: Nurse for county health work. Salary \$1,800 per year with travel allowance (additional) of \$500 per year. Address District Health Department 2, West Branch, Mich.

Instructor in Bacteriology, Medical School, large midwestern university, M.D. (or Ph.D. or D.Sc. in Bacteriology); Male. Salary \$1,800 to \$2,500 according to age and experience. Write Box D, Employment Service, A.P.H.A.

#### POSITIONS WANTED

##### ADMINISTRATIVE

Teaching or administrative position desired by physician, aged 48. Experienced teacher in preventive medicine and public health, now employed at prominent medical school; 20 years' experience in municipal health administration and epidemiology. A-491

Physician, B.S., M.D., and M.S.P.H., University of Michigan, aged 35, experienced city-county health administration and as director university student health service. Will consider permanent responsible position offering good income. A-492

Physician, age 32, 5 years' clinical and administrative experience in venereal dis-



cases, wishes administrative position in venereal disease control, preferably at state level. A-490

#### HEALTH EDUCATION

Teacher and research worker, man, Ph.D., age 52. Extensive record as college professor of biology and hygiene and investigator; for the past two years engaged in research. H-499

Health Educator, Negro, man with background of High School administration and M.S.P.H. from University of Michigan, seeks position in Health Education. Public agency or educational field. Excellent references. H-497

Woman, M.S. in public health, excellent graduate training in education, 8 years' experience as business executive (sales and publicity). Just completed year's research in community education. Seeks good administrative position. H-496

Health Educator, M.A. in Education, 10 years' background in community organization for public health education, also teaching of personal and community health at high school and college levels. Public health nurse, able to teach mental and social hygiene as well as general health education. East preferred. H-498

Health Educator. Man with M.S. in preventive medicine and public health. Negro. Seeks position in Health Education or field work with official or non-official agency. H-500

Woman with master's degree in health education, 12 years' successful experience in public school and college teaching, administration and research. Will consider position in normal school, public schools, or in official or nonofficial health agencies. Prefers South or East. Available at once. H-501

#### LABORATORY

Milk Sanitarian and Technologist, age 37, Ph.D., Bacteriology, Wisconsin; 10 years' experience in milk and food sanitation from industrial and official angle, seeks administrative position with opportunity for research or investigational work preferred. L-381

Chemist, Sc.D., Biochemistry, Johns Hopkins University. Age 31. Public health laboratory experience, teaching experience. Desires position with promise of advancement, preferably in commercial organization. L-461

Bacteriologist, young man 28, with B.S. in industrial science, experienced in newspaper work, salesmanship and now employed in state department of health laboratory, seeks position as bacteriologist or doing promotional work of public health nature. L-465

#### SANITARY ENGINEERING

Public Health Engineer, M.S. Harvard, experienced in public health and industrial hygiene, wishes position of better sort in public health engineering or industrial hygiene. E-470

#### STATISTICAL

Woman with academic, business and research experience in vital statistics, seeks a position in the vital statistics division of a state or city health department, preferably as registrar. S-459

Experienced and well trained public health nurse, with background of tuberculosis, venereal disease, school, industrial, and generalized services, will shortly be available for appointment. Three years as director of state nursing service. Experienced as university teacher of public health nursing. M.A., New York University. M-449

*Advertisement*

# Opportunities Available

**PUBLIC HEALTH PHYSICIANS**—(a) Pediatric consultant; state health department; 2 to 3 years' training in pediatrics required; \$3,900-\$4,800; Midwest. (b) Medical director, western rural area; emphasis on maternal and child health; must be qualified to exercise leadership in organization and administration of medical services. (c) Venereal disease clinician qualified to direct several small clinics; appointment newly created; around \$4,200; South. PH4-1, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

**PUBLIC HEALTH NURSES**—(a) Director of nurses for municipal public health nursing service; Gulf state. (b) Educational director; well known maternity service; degree, year's course public health nursing required; obstetrical experience desirable; \$200. (c) Out-patient department supervisor qualified to combine duties with those of instructor of public health nursing; clinic con-

nected with splendid 200 bed hospital; minimum entrance stipend, \$140, meals; early increase. (d) Orthopedic field nurse, state health department; duties include direction of services to crippled children in all areas not organized in health units; public health certificate, postgraduate work orthopedics required; \$165, travel allowance. (e) Graduate nurse with some formal training in public health for appointment as public health nurse on staff of children's hospital (universally affiliated); knowledge of nursing education essential; \$125, mileage allowance. PH4-2, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

**LABORATORY DIRECTOR**—Man or woman with Ph.D. or M.D. degree, thoroughly qualified in bacteriology and serology for appointment as director of state-registered laboratory; around \$200; Midwest. PH4-3, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

*Advertisement*

# Situations Wanted

**PUBLIC HEALTH PHYSICIAN**—Certified public health physician is available; bachelor's and medical degrees from southern university; C.P.H., Johns Hopkins; 4 years, director student health service, state university; 5 years, executive position with state health department. PH4-4, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

**BACTERIOLOGIST AND IMMUNOLOGIST**—Ten years' teaching and research in immunology, leading university; B.S., Ph.D. degrees; memberships: American Association Pathologists and Bacteriologists, American Association of Immunologists.

PH4-5, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

**PUBLIC HEALTH NURSE**—Excellent trained public health nurse is available; A.B. degree, eastern college; graduate of school of nursing of university hospital; year's postgraduate training public health nursing; certified; nearly 15 years' executive experience in public health nursing; past several years, executive secretary, city health council; a very superior woman of broad and varied experience; has made distinct contribution to field of public health nursing. PH4-6, Medical Bureau (Burneice Larson, Director) Palmolive Building, Chicago.

# NEWS FROM THE FIELD

## COMMISSION ON CHILDREN IN WARTIME

THE Children's Bureau Commission on Children in Wartime, including 56 members appointed by Katharine F. Lenroot, Chief of the Children's Bureau of the U. S. Department of Labor, ended its three day session in Washington, D. C., on March 18, with the adoption of a Children's Charter in Wartime. The charter reads in part—

We call upon citizens young and old to join together to:

I. Guard children from injury in danger zones.

II. Protect children from neglect, exploitation, and undue strain in defense areas.

III. Strengthen the home life of children whose parents are mobilized for war or war production.

IV. Conserve, equip, and free children of every race and creed to take their part in democracy.

Concrete recommendations for translating these principles into action were adopted. They are summarized below. The paragraph numbers correspond to the number of the objective.

I. The registration and identification of all children; the evacuation of children with their mothers, if possible, from danger zones with plans for adequate reception and care; the expanding of summer vacation camps for city children using volunteers, surplus commodities, and other aids as tests of evacuation methods and as an investment in health; appropriate immunization of all children against communicable disease; attention to the alleviation of childhood anxiety.

II. The maintenance of adequate health and welfare services for children

and their parents in every community where war production or military camps are located; the assignment of obstetricians and pediatricians to defense areas; the establishment of child guidance clinics; the expansion of school opportunities, including nursery schools for young children; the placement of recreation leaders, group workers, and child welfare workers in defense communities where facilities for play and for recreation centers are overtaxed.

III. By providing for the economic needs of children whose fathers are in the Service and for medical and hospital care for wives and children; supplementing the Social Security program with a government insurance program for civilians injured or killed as a result of war activities; providing adequate housing, with health services and group activities for children in all housing projects; assisting mothers who are employed, or planning to enter employment, with care of children, including health supervision, opportunity for nursing, recreation outside school hours; extending government aid to dependent children of all parents economically unable to maintain a home for their children; providing general assistance and benefits for temporary and permanent disability.

IV. By providing public health nursing service, prenatal clinics, delivery care, child health conferences and clinic and hospital service for sick children in every county in the United States; providing school meals and extending penny milk to all children; expanding social

services for children; providing leisure time activities; analyzing demands for the employment of children to determine whether all available adult man power has been utilized and distinguishing between labor shortage and the desire to obtain cheap labor; discouragement of employment of children at wages that undermine wages for adult labor, of children under 14, of children under 16 in manufacturing and mining occupations, of children under 18 in hazardous occupations; providing a nation-wide extension of health services for school children, including medical care as needed and health instruction, with the coöperation of health and education authorities; encouragement of boys and girls to participate in home and community war efforts.

The commission adopted three resolutions on maternal and child health services, on child welfare services, and on increasing federal appropriations for health and welfare services for maternity patients and children in defense areas.

Dr. Leonard Mayo, Dean of the School of Applied Social Services, Western Reserve University, Cleveland, Ohio, and President, Child Welfare League of America, was elected Chairman of the commission and was authorized to appoint an executive committee to carry on the work of the Commission between meetings. The executive committee as appointed includes:

Leonard Mayo, Cleveland, Ohio, *Chairman*  
 Edith Abbott, Chicago, Ill.  
 Fred L. Adair, M.D., Chicago, Ill.  
 Mildred Arnold, Indianapolis, Ind.  
 M. O. Bousfield, M.D., Chicago, Ill.  
 Robin C. Buerki, M.D., Philadelphia, Pa.  
 Charlotte Carr, Chicago, Ill.  
 Horton Casparis, M.D., Nashville, Tenn.  
 Grace L. Coyle, Cleveland, Ohio  
 Henry F. Helmholz, M.D., Rochester, Minn.  
 Ellen C. Potter, M.D., Trenton, N. J.  
 George S. Stevenson, M.D., New York, N. Y.  
 Katharine Tucker, Philadelphia, Pa.  
 Herbert D. Williams, Warwick, N. Y.

Other members of the commission from the field of public health included:

Reginald M. Atwater, M.D., New York, N. Y.  
 Leona Baumgartner, M.D., New York, N. Y.  
 Courteney Dinwiddie, New York, N. Y.  
 Homer Folks, New York, N. Y.  
 Percy F. Guy, M.D., Seattle, Wash.  
 Ruth Houlton, New York, N. Y.  
 Felix J. Underwood, M.D., Jackson, Miss.

#### INTERPRETING THE TIRE RATIONING REGULATIONS FOR THE PUBLIC HEALTH WORKER

REPLYING to a recent inquiry from the American Public Health Association as to the application of the Tire Rationing Program to public health departments and their employees, the following statements have been made on behalf of J. K. Galbraith and the Rubber and Rubber Products Section of the Office of Price Administration, Washington:

Under the Regulations vehicles which are used exclusively in the enforcement of laws which relate specifically to the protection of public health and safety are eligible for tires. The law enforcement services must relate directly to the protection of the public from accident and disease. Vehicles which are eligible under this section cannot be used to convey public health and safety officials to and from their usual stations, except in case of emergency. The Local Boards are not authorized to issue certificates to public health officials where public means of transportation will serve.

A vehicle used exclusively by a visiting nurse for professional services is also eligible for tires. A visiting nurse has been defined as any nurse who is employed by a clinic, hospital, government agency and similar organizations, or by an industrial concern to make nursing or inspection calls for such agencies. The term visiting nurse does not include private nurses.

All applications for tire certificates must be made to Local Tire Rationing Boards.

#### NUTRITION FOUNDATION INCORPORATED

IT was announced on March 13 that the Nutrition Foundation, Inc., New York, N. Y., recently formed by a group

of food industries "to develop and apply the science of nutrition for the improvement of the diet and health of the American people," would have as its scientific director Professor Charles G. King, F.A.P.H.A., of the University of Pittsburgh, a nutrition authority. Professor King has been associated with Washington State College, the University of Pittsburgh, Columbia University, the Johns Hopkins University, and the University of Cambridge, England. In 1932 he isolated vitamin C, a work carried out independently but simultaneously with the isolation of the same vitamin for which Dr. Szent Gyorgyi of Budapest was awarded the Nobel Prize. Professor King received the award of the Pennsylvania Public Health Association in 1939 and the Nutrition Award in 1941 in recognition of his scientific contributions to this field.

President Karl T. Compton of the Massachusetts Institute of Technology, Chairman of the Foundation's Board of Directors, announced that George A. Sloan, Commissioner of Commerce of New York City, would be President of the Foundation. Mr. Sloan revealed that 16 food companies have so far subscribed \$800,000 to the new foundation, which has now completed its organization.

Dr. Compton said that "the problem of nutrition will become increasingly a desperate world problem as the war proceeds and will be one of the greatest of all world problems in the period of reconstruction which will follow. The objective of the Nutrition Foundation is to aid in the discovery of scientific facts regarding nutrition and to aid in making these facts available to the public which eats food, in such a manner that the diet of the American people may be improved as much as possible in the directions indicated by soundly established scientific findings."

Professor King said that "the primary

emphasis in the Foundation's program shall be upon service to humanity expressed through the medium of research in nutrition." Federal Security Administrator, Paul V. McNutt, told the nutritionists and food industrialists that there were two problems upon which emphasis must be placed—"that of translating science into action, and that of solving the problem of reaching the ultimate consumer." The consumer, he said, must be reached with the facts and those facts must carry a conviction that will lead to action. Means must be found to gear the manufacturer, the advertiser, and the grocer into the one great objective of getting better food to every family's dinner table.

#### U. S. PUBLIC HEALTH SERVICE ORIENTATION COURSE FOR PUBLIC HEALTH PERSONNEL

AN orientation course for medical officers, public health nurses, sanitary engineers, and laboratory technicians organized under the auspices of the U. S. Public Health Service at the National Institute of Health, Bethesda, Md., and in coöperation with nearby public health agencies, has been offered from April through December, 1942.

Four hundred and sixty-eight public health workers have received special instruction to fit them for duty in emergency health and sanitation work in defense areas. Of the total, 100 were medical officers, 127 nurses, and 241 sanitary engineers and laboratory technicians, all of whom have now been assigned to the eight districts of the Public Health Service and among 46 states and territories.

In reporting the completion of this work, Senior Surgeon M. V. Ziegler, M.D., as Director, has described the curriculum offered to these individuals and the methods which have been used to prepare qualified persons in response to the urgent demands for additional

public health personnel from the states and territories. Assisting Dr. Ziegler have been Anna Heisler, Associate Director of Nursing, as nursing consultant, and Sanitary Engineer E. S. Tisdale, Associate Director of Engineering. Three divisions of the Public Health Service, namely, Personnel and Accounts Division, States Relations Division, and the National Institute of Health have had the major responsibility of carrying out the orientation courses.

#### EMERGENCY CASUALTY HOSPITAL PLANS

**PAUL V. McNUTT**, Federal Security Administrator, and **James M. Landis**, Director of the Office of Civilian Defense, Washington, announced on March 12 the plan to provide temporary hospitalization for civilians injured as the result of enemy action.

This program will be carried out by the Medical Division of the OCD in coöperation with the U. S. Public Health Service and state and local authorities. It provides that all voluntary and governmental hospitals in the nation may serve as Casualty Receiving Hospitals of the Emergency Medical Service. Hospitals so engaged will be reimbursed by the federal government for the care of such casualties at established rates. Certain hospitals and other institutions in safe areas are to be designated as Emergency Base Hospitals for reception of casualties or other patients whom it may be necessary to evacuate from Casualty Receiving Hospitals.

#### NEW DIVISION IN OFFICE OF INTER-AMERICAN AFFAIRS

**THE** Coördinator of Inter-American Affairs, **Nelson A. Rockefeller**, on March 5 announced a program aiming to promote the health and defense of the Western Hemisphere. It will be directed by **Dr. George C. Dunham**, formerly of the Army Medical Corps, as head of a division of health and

sanitation in the Office of Inter-American Affairs.

According to the press, this mission will carry out recommendations of the Inter-American Conference at Rio de Janeiro and will concentrate on those areas which are considered vital in carrying out the defense of the hemisphere. Among other projects will be the regulation of water supplies, waste disposal systems, building of hospitals in defense areas, and the training of health and sanitation specialists in the Latin American countries.

It is stated that this program will be linked with activities of the Pan American Sanitary Bureau, as well as with the commissions organized in the other American republics under the Inter-American Development Commission and various private foundations. Work is already under way near Quito and Guayaquil in Ecuador. **Dr. Walter C. Earle** and **Wyman Stone**, sanitary engineers, are also identified with the division.

#### ECUADOR INSTITUTE OF HYGIENE

**A** NATIONAL Institute of Hygiene has been created at Guayaquil, Ecuador; it will be housed in a new building now under construction. The International Health Division of the Rockefeller Foundation, New York, and the government of Ecuador are financing the project, as well as sharing the maintenance for a five year period, after which time it is expected that the Ecuadorian government will assume complete responsibility. There will be installed in the new building the laboratories of bacteriology, chemistry, medical research, preparation of anti-smallpox vaccine, bacterial vaccines, anatoxins, BCG laboratory, special laboratories for epidemics and yellow fever, and in future the preparation of therapeutic sera. It is also planned to have departments for general services to the public.

MINIMUM REQUIREMENTS FOR PLUMBING AND STANDARDIZATION OF PLUMBING EQUIPMENT

AN important Sectional Committee of the American Standards Association on Minimum Requirements for Plumbing and Standardization of Plumbing Equipment (A40) was organized in 1928 under the sponsorship of the American Society of Mechanical Engineers. The scope of this sectional committee includes minimum requirements for plumbing, including water supply distributing systems, drainage and venting systems, plumbing fixtures, apparatus devices; and the standardization of plumbing equipment, including materials, uniformity of roughing-in dimensions, efficiency of operation, and other performance specifications.

In accordance with American Standards Association procedure, this committee has been set up with representation from industry, from government, from the public, and from several specialties, including architects, hospital administrators, ceramic experts, hotel officers, real estate operators, marine engineers, and others.

Among several subcommittees, Subcommittee No. 1 on Minimum Requirements for Plumbing is most closely related to public health. Theodore I. Coe of the American Institute of Architects, Washington, D. C., is Chairman.

At the suggestion of the sponsor, an invitation has been extended by the American Standards Association Council to the American Public Health Association to be represented on Committee A40 and Subcommittee No. 1 with two delegates and, in addition, to become co-sponsor of the committee with the American Society of Mechanical Engineers. This invitation has been accepted. The Association is now a co-sponsor, and Dr. Abel Wolman, Chairman of the Executive Board of the Association, has designated as the A.P.H.A. representatives to Committee

A40 and to Subcommittee No. 1 Sol Pincus, Deputy Commissioner of Health, New York City Department of Health, and M. Warren Cowles of the Hackensack Water Company, New Milford, N. J.

Among other members of this committee and subcommittee the following from the field of public health are noted: Dean Thorndike Saville, Professor Charles G. Hyde, Professor F. M. Dawson, Major Joel I. Connolly, Charles A. Holmquist, Arthur P. Miller, and James F. Murphy.

WESTERN BRANCH A.P.H.A. MEETS IN SEATTLE MAY 27-29

DR. ADOLPH WEINZIRL, Portland, Chairman of the Program Committee of the Western Branch of the American Public Health Association has announced that the meetings in Seattle, May 27 to 29, will be centered around the theme, "Health Services in War Time." Dr. Weinzirl and his committee are formulating the program with a focus on the health and protection services that are most affected by the war situation. The medical protection of civilians in disaster, the shifting of population groups due to the war effort, and new health implications, accentuated hazards, changes in emphasis and administrative problems will be considered.

CONSERVATION OF SCHOLARLY JOURNALS

THE American Library Association created in 1941 the Committee on Aid to Libraries in War Areas, headed by John R. Russell, the Librarian of the University of Rochester. The committee is faced with numerous serious problems and hopes that American scholars and scientists will be of considerable aid in the solution of one of these problems.

Many sets of journals will be broken by the financial inability of the institutions to renew subscriptions. As far as possible they will be completed from a stock of periodicals being purchased by the committee. Many more will have

been broken through mail difficulties and loss of shipments, while still other sets will have disappeared in the destruction of libraries. The size of the eventual demand is impossible to estimate, but requests received by the committee already give evidence that it will be enormous.

With an imminent paper shortage attempts are being made to collect old periodicals for pulp. Fearing this possible reduction in the already limited supply of scholarly and scientific journals, the committee hopes to enlist the coöperation of subscribers to this journal in preventing the sacrifice of this type of material to the pulp demand. It is scarcely necessary to mention the appreciation of foreign institutions and scholars for this activity.

Questions concerning the project or concerning the value of particular periodicals to the project should be directed to Wayne M. Hartwell, Executive Assistant to the Committee on Aid to Libraries in War Areas, Rush Rhees Library, University of Rochester, Rochester, N. Y.

#### FURTHER RESTRICTIONS ON THE USE OF CHLORINE

THE Division of Industry Operations, War Production Board, Washington, on February 27 released an order, WPB 362, covering drastic restrictions on the use of chlorine.

A-2 ratings are given to chlorine for the treatment of potable water and for sewage treatment. A-6 ratings are given to hospital uses, dairy and other food processing plant sanitation, public eating and drinking establishment sanitation, public and institutional swimming pool sanitation, and for the manufacture of products for medicinal, surgical, dental and veterinarian uses. Private swimming pools are classified as B-5.

Interpreting this order, W. H. Chamberlain, the Chief of the Chlorine Unit,

states under date of March 7 that the Chlorine Unit interprets public and institutional pools as those used by the public and open to anyone, either free or on the basis of a fee. Private pools are those whose use is restricted to members only, or for home use.

The A.P.H.A. has been requested to advise persons concerned with the use of chlorine that it is necessary to return empty cylinders to the supplier as promptly as used.

This order, WPB 362, prohibits the use of chlorine or products containing available chlorine in the bleaching of foodstuffs, the bleaching of wiping rags and waste, and the manufacture of cosmetics and toilet preparations. Curtailments are applied to laundry operations, private swimming pools and in certain other activities. No further restrictions are made on pulp and paper manufacturers. It is believed that sufficient chlorine will be available to fill at least some of the demands for all the ratings, although chlorine is in demand for a variety of war uses.

#### TWELFTH NEW ENGLAND HEALTH INSTITUTE

THE Twelfth New England Health Institute will meet at the Biltmore Hotel, Providence, R. I., April 21 to 23 under the auspices of the six State Health Departments in New England and their respective health officers. Edward A. McLaughlin, M.D., State Health Officer of Rhode Island, is Executive Chairman.

Among special sessions there will be consideration of cancer, communicable diseases, crippled children, environmental sanitation, health education, industrial hygiene, laboratory, maternal and child health, nutrition, public health nursing, school health, tuberculosis, venereal disease, vital statistics, war preparations, and a meeting of the New England Water Works Association.



NORTHERN CALIFORNIA PUBLIC HEALTH  
ASSOCIATION RECOGNIZES CONTRIBU-  
TIONS FROM DRS. KELLOGG AND CREEL

THE Northern California Public Health Association held a meeting on March 7 at which time Dr. Richard H. Creel, Medical Director, U. S. Public Health Service, paid a glowing tribute to Dr. W. H. Kellogg who has retired as Director of the State Hygienic Laboratory. It then developed that Dr. Creel was retiring on that very day after 40 years of active service, during much of which he has been a powerful force in public health development in the West. The Northern California Public Health Association then passed the following resolutions:

WHEREAS Dr. Richard H. Creel, Medical Director, U. S. Public Health Service, finishes forty years of active service today and is about to retire from active status; and

WHEREAS more than one-third of these years was spent in valuable service to the Pacific basin and especially to the Pacific Coast; and

WHEREAS his service on this Coast has repeatedly been linked with times of public health crisis with special reference to plague control; and

WHEREAS Dr. Creel has had a long and distinguished service in the field of public health for the Nation as a whole, having joined the U. S. Public Health Service in 1902, in which Service he was advanced through every promotional grade, including Assistant Surgeon General; and

WHEREAS he has been an officer of exemplary and sterling character, prosecuting his duties diligently, unswerving in his determination to uphold the best of public health principles, foregoing the pleasures and rewards of scientific research to devote himself to the application of sound administrative measures; and

WHEREAS in addition to all this, he has been a pillar of strength, a valued colleague, and a courageous leader; now therefore be it

RESOLVED that the Northern California Public Health Association records its appreciation of and high regard for Dr. Creel. We look forward to his continued association with us and his support of progressive public health measures. We wish him the fullest enjoyment of a well-earned measure of leisure and anticipate with pleasure his

continued residence on this Coast and his further participation in our councils.

WHEREAS Wilfred H. Kellogg, Chief of the Division of Laboratories of the California State Department of Public Health, has retired from active work after devoting more than a quarter century of outstanding service to the Department and to the people of the State of California; and

WHEREAS during these years Dr. Kellogg has rendered valuable service in public health administration and in the field of bacteriology and the laboratory sciences as well as being a teacher, counselor, and friend to the public health profession; and

WHEREAS Dr. Kellogg's early recognition of plague and his courageous defense of his findings saved this Coast untold economic and human loss; and

WHEREAS his researches in the laboratory field, especially in diphtheria immunization, have been a great contribution to this State and Nation; and

WHEREAS in particular the State of California is indebted to him for a carefully conceived and well-executed program for certification and high professional standards for laboratory personnel; and

WHEREAS his scientific attitude and knowledge over these many years have exerted a salutary influence on his colleagues, tempering the enthusiasm of the over-zealous, stimulating the imagination of the uninspired and giving renewed determination to the discouraged; now therefore be it

RESOLVED that we record our appreciation of Dr. Kellogg's long continued service, the permanent value of his researches, and his generous support of progressive public health programs. We wish him the fullest measure of satisfaction in his accomplishments and we look forward with pleasure to his continued availability as counselor and friend to his colleagues.

NATIONAL NEGRO HEALTH WEEK

THE 28th anniversary of National Negro Health Week will be held April 5-12. The theme "Opportunities in the National Defense Program for Improvement of Community Health" has been designated the special objective for 1942. Roscoe C. Brown, D.D.S., U. S. Public Health Service, Washington, D. C., is Chairman of the National Negro Health Week Committee.

# CITATIONS BY THE AMERICAN SOCIAL HYGIENE ASSOCIATION

THE William Freeman Snow Award for distinguished service to humanity was presented to Frederick Fuller Russell, M.D., Sc.D., Brigadier General, United States Army, at the general session of the 29th Annual Meeting of the American Social Hygiene Association held in Boston, February 3. The presentation was made by Major General Merritte W. Ireland, former Surgeon General, United States Army. General Russell, now Professor Emeritus of the Harvard School of Public Health, and formerly General Director of the International Health Division, Rockefeller Foundation, was instrumental in the first World War in the Army's program for venereal disease control.

The American Social Hygiene Association has conferred honorary life membership on the following leaders in the control of the venereal diseases:

Elizabeth Campbell, M.D.

Bascom Johnson

Joseph Royal Phelps, M.D., Captain U.S.N., Retired

Claude C. Pierce, M.D., Medical Director, U. S. Public Health Service, Retired

John D. Rockefeller, Jr.

Charles S. Stephenson, M.D., Captain, U. S. Navy

## HARVARD OFFERS 3 MONTHS' COURSE IN INDUSTRIAL HYGIENE

THE Harvard School of Public Health, Boston, has announced that a course in industrial hygiene open to physicians and engineers will be given from April 27 to August 1. The course will be essentially the same as that given during the past year to three groups of Navy Medical and Engineering officers. The tuition will be \$200. Credit toward a graduate degree in public health or engineering will be given those who successfully complete the work. It is announced that the course will probably be repeated during

the first 3 months of the next academic year, beginning September 21, 1942.

## UNIVERSITY OF MISSOURI DEGREES

THE attention of the A.P.H.A. Committee on Professional Education has been called to the fact that the Department of Civil Engineering of the University of Missouri offers graduate courses in sanitary engineering leading to the Master of Science and the Doctor of Philosophy degrees. In the academic year 1940-1941, 10 students were registered for the M.Sc. degree with none for the Ph.D. During this period 7 students received the M.Sc. degree. This information supplements that on degrees and certificates in public health published in the December, 1941, JOURNAL, page 1,306.

## DR. FISCHELIS CALLED FOR WAR SERVICE

THE Civilian Supply Division of the War Production Board has asked for the services of Robert P. Fischelis, Phar.D., for part-time service as Chief of the Section of Medical and Health Supplies of the Civilian Supply Division of the War Production Board. Dr. Fischelis has been Secretary and Chief Chemist of the New Jersey Board of Pharmacy and is a member of the New Jersey State Board of Health. He will organize a staff of specialists and consultants in the field of hospital, medical, and drug supplies at the Washington Office of the War Production Board.

## PERSONALS

### Central States

GEORGE W. BASSOW, M.D., of Steubenville, Ohio, has resigned as Health Commissioner of Jefferson County, to return to private practice in Massachusetts.

JOSEPH L. BRYAN, M.D.,† of Xenia, Ill.,

† Member A.P.H.A.

of the Flora office, will take over the work in Hamilton and White Counties, included in this district.

FORDER F. DEMUTH, M.D., of Hicksville, Ohio, has been reappointed Health Commissioner of Defiance County, succeeding HENRY C. LINDERSMITH, M.D., of Sherwood, resigned.

WILLIAM H. DRISSEN, M.D., of Port Washington, Wis., has been reappointed Health Officer of Ozaukee County.

HAROLD J. GORDON, M.D., for a number of years in charge of the venereal disease program of the Akron Health Department, has been appointed Venereal Disease Control Officer of the Ohio State Department of Health.

BEATRICE A. T. HAGEN, M.D., of Zanesville, Ohio, who has been Health Commissioner of Muskingum County for 12 years, has been reappointed for a one year term. She is also Secretary of the Muskingum County Academy of Medicine.

HAROLD J. HALLECK, M.D., of Winamac, Ind., was recently appointed Health Commissioner for Pulaski County for a term of 4 years.

ROY W. HARRELL, M.D.,† of Carbondale, Ill., will take over the work in Williamson, Saline, Gallatin, and Franklin Counties.

CHESTER S. HEIMLICH, M.D., of Attica, Ohio, has resigned as Health Officer of Seneca County to devote his full time to private practice.

EDWARD D. HUDSON, M.D., has been appointed Health Officer of Lake Geneva, Wis., to succeed LAWRENCE H. DONATH, M.D., who resigned to transfer his medical practice to Milwaukee.

ALEXANDER S. MACK, M.D., of Oak Harbor, Ohio, has been reappointed Health Commissioner of Ottawa County.

CLIFFORD H. MAYFIELD, M.D.,† of Reynolds, Ind., has been reappointed

Health Officer of White County for a 4 year term, beginning January 1.

RANSLEY J. MILLER, M.D., of Topeka, Kans., has been appointed Acting Secretary of the Topeka Board of Health, to succeed DR. CHARLES B. STEPHENS, who resigned.

KENNETH F. PREFONTAINE, M.D., of Slinger, Wis., has been appointed Health Officer for the Village of Slinger; he occupies the same position for the village of Polk.

BENJAMIN L. SARGENT, M.D., has been appointed Health Officer of Park Ridge, Ill., to succeed the late DR. IRVIN J. PASCOE.

FRANK TERNOCKY, JR., M.D., of Bloomville, Ohio, has been elected Health Commissioner of Seneca County.

HOMER S. WEST, M.D., Clairsville, Ohio, has been appointed Health Commissioner of Belmont County, filling the vacancy that occurred when DR. WILLIAM B. BAILEY, now of Morgantown, W. Va., resigned.

ROBERT G. WHITE, M.D.,\* becomes Director of the Division of Preventable Diseases of the North Dakota State Department of Health. At present Dr. White is District Health Officer of the District Health Office in Valley City, N. D.

#### Eastern States

LEONA BAUMGARTNER, M.D., PH.D.,\* has been appointed as Director of the Bureau of Child Hygiene of the Department of Health, New York, N. Y. Dr. Baumgartner, who has been Acting Director of the Bureau since January 1, 1941, was first in the civil service examination recently held for this position.

HUGH H. DARBY, M.D., Columbia University, New York, scientist and author of many authoritative works, has joined the staff of the Borden Vitamin

\* Fellow A.P.H.A.

† Member A.P.H.A.

Company, for research and development in the production and application of vitamins and hormones.

**WILLIAM B. FULTON, M.D., M.P.H.,\*** Senior Surgeon in the U. S. Public Health Service Reserve and a former director of the Bureau of Industrial Hygiene of the Pennsylvania Department of Health, was recently announced as Chief of the Health Division in the Bureau of Mines, Department of the Interior.

**FRED LAURENCE MOORE, M.D., M.P.H.,** has been appointed Director of the Division of Health Studies of the Commonwealth Fund, New York, N. Y., succeeding the late Watson Frank Walker, Dr.P.H.. Dr. Moore received his medical degree at Dalhousie in 1924. For some years he was health officer of Sullivan County, Tenn., and is a graduate of Johns Hopkins School of Hygiene and Public Health with an M.P.H. in 1934. Since 1939 he has been Associate Professor and Professor in the Department of Preventive Medicine, at Long Island College of Medicine, Brooklyn, N. Y.

**DR. WILLARD C. RAPPLEYE,** Commissioner of Hospitals of the City of New York since October 1, 1940, has given up his city post to return to his duties as Dean of the College of Physicians and Surgeons of Columbia University, New York. Dr. Rappleye took the post in 1940 on a temporary basis.

**PROFESSOR G. M. RIDENOUR †** has been appointed Associate Resident Lecturer on Public Health Engineering at the School of Public Health, University of Michigan, Ann Arbor. Professor Ridenour was formerly Associate Professor of Sanitary Engineering at Pennsylvania State College.

**MILTON ROSE, M.D., DR.P.H.,†** has

been appointed Medical Director of the Pacific Coast Area of the American Red Cross, with headquarters in San Francisco, Calif., as announced by Chairman **NORMAN H. DAVIS** of the American Red Cross in Washington. Dr. Rose, who is a graduate in medicine and public health from Yale, was Assistant Professor of Physiology at the University of California and Assistant Director of the School of Public Health at the same institution. He has most recently been Professor of Public Health at the University of Pennsylvania, in Philadelphia.

**HERMAN G. WEISKOTTEN, M.D.,\*** Dean of the Syracuse University College of Medicine, Syracuse, N. Y., has been appointed Secretary of the Council on Medical Education and Hospitals of the American Medical Association, Chicago, to succeed the late **WILLIAM DICK CUTTER, M.D.** Dr. Weiskotten, who was Commissioner of Health of the city of Syracuse 1926-1928 and who has been Professor of Preventive Medicine at Syracuse University, is a member of the New York State Public Health Council, a member of the Executive Committee of the State Committee on Tuberculosis and Public Health of New York, and a Fellow of the American Public Health Association. He recently collaborated with the late Dr. Cutter in a personal inspection and survey of medical colleges in the United States and Canada.

#### Southern States

**AARON WILSON BROWN, M.D.,** of Richmond, Va., recently resigned as full-time Venereal Disease Control Officer of Richmond, to locate in Pocahontas.

He was the first to hold this position.

**ANDREW B. COLLEY, M.D.,†** of Dixon, Ky., has succeeded **GEORGE B. DAVIS, M.D.,** as Health Officer in Grayson County. Dr. Coley will divide his time between Grayson and Hart Counties, with headquarters in Leitch-

\* Fellow A.P.H.A.

† Member A.P.H.A.

field, and Dr. Davis will move to Connecticut, it is reported.

LELAND H. DAME, M.D.,† has resigned his position as Director of the Highlands-Glades County Health Department, and has accepted appointment as Director of the Seminole County Health Department, with headquarters at Sanford, Fla.

LORENCE W. FELLER, M.D., of Fredericksburg, Tex., has been named Health Officer of Gillespie County, to succeed the late JOSEPH E. PEDEN, of Fredericksburg.

JOHN D. FOUTS, M.D., of London, Ky., Health Officer of Laurel County, has been appointed Director of Venereal Disease Control for the city of Louisville.

EDWARD S. GRADY, M.D., of Winston-Salem, N. C., has been placed in charge of the health unit in Johnston County, succeeding WILL H. LASITER, JR., M.D., of Smithfield, resigned. Dr. Grady has been Assistant Health Officer of the unit covering Forsyth, Stokes, Yadkin, and Davie Counties.

LOYD M. GRAVES, M.D.,\* Memphis, Tenn., has been named Director of the Memphis and Shelby County Health Departments, recently consolidated.

RUTH E. GROUT, PH.D.,\* Senior Supervisor of Health Education, Department of Health and Safety, Tennessee Valley Authority, Chattanooga, has been appointed Assistant Professor in Preventive Medicine and Public Health at the University of Minnesota, as announced by GAYLORD W. ANDERSON, M.D., Professor and Head of the Department of Preventive Medicine and Public Health, Minneapolis. Miss Grout will begin her work with the University of Minnesota with the fall term.

JOHN H. MUSSER, M.D., Professor of Medicine, Tulane University of Louisiana School of Medicine, New Orleans, La., has resigned as President of the State Board of Health, effective February 1.

LOWELL J. REED, PH.D.,\* Professor of Biostatistics and Dean at the Johns Hopkins School of Hygiene and Public Health, Baltimore, Md., has been appointed Chairman of a National Commission on Vital Records established at the request of the Association of State Health Executives and the American Association of Registration Executives under the Health and Medical Committee of the Office of Defense, Health and Welfare Services.

SEBORN C. RICHARDSON, M.D., of Bryan, Tex., has been named Health Officer of Bryan.

EDWIN BRUCE UNDERWOOD, M.D., has been placed in charge of the Webster County Health Department, Dixon, Ky., to succeed ANDREW B. COLLEY, M.D.

LUTHER P. WALTER, M.D., formerly of El Paso, Tex., is now Director of Jefferson County Health Unit, Port Neches, Tex.

THOMAS WILSON, M.D., of Wynne, Ark., has been elected President of the Arkansas State Board of Health.

C. L. MENGIS, M.D., has been appointed, effective February 1, Director of the Louisiana State Board of Health, succeeding JOHN H. MUSSER, M.D., who has served in this position since September, 1940. Dr. Musser resigned in order to give full time to his work as Professor of Medicine at Tulane University. Dr. Mengis, formerly Head of the Bureau of Crippled Children in the Louisiana State Department of Health and recently Director of Iberia Parish Health Unit, will be assisted by DR. ROBERT H. ONSTOTT, Executive Officer, staff member of the U. S. Public Health Service, and DR. FORD S. WILLIAMS,

\* Fellow A.P.H.A.

† Member A.P.H.A.

Assistant State Health Officer. Dr. Mengis is a graduate of Tulane University and was trained in public health at Vanderbilt. For 5 years he was associated with the U. S. Public Health Service, following which, according to the press, he was in private practice for 24 years.

#### Western States

DR. I. O. CHURCH,\* for some years County Health Officer with the Alameda County Department of Health, San Leandro, Calif., has resigned to accept a position as Director of the Branch County Health Department, Coldwater, Mich., under the auspices of the W. K. Kellogg Foundation, effective February 1.

FRANK J. CRANDALL, JR., M.D.,\* formerly Epidemiologist for the Los Angeles City Health Department, is now Lieutenant-Colonel in the Medical Corps of the U. S. Army, serving as Medical Inspector for Camp San Luis Obispo, Calif.

AGNES M. ENGLISH, M.P.H.,† Health Education Consultant with the Wyoming State Department of Public Health, Cheyenne, has resigned to accept an appointment as regional nutrition representative of the Office for Emergency Management. After a training period in Washington Miss English will be assigned to the XII Social Security Region, which includes Arizona, Colorado, Idaho, Utah, and Wyoming, with headquarters in Denver.

ROBERT M. MATTS, M.D.,† of Yuma, Ariz., Director of the Yuma County Health Service, has been called into active service.

ABE L. SCHEFF, M.D., formerly of Rosedale, Miss., Passed Assistant Surgeon, U. S. Public Health Service, Reserve, has been appointed Director

of the Santa Cruz Health Service, which on January 1 ceased to be a part of Health District Number 1.

#### Foreign

DOMINGO RAMOS, M.D.,\* Havana, Cuba, was appointed Minister of Health and Welfare of Cuba by President Fulgencio Batista on February 2. Dr. Ramos has for some years been serving as Minister of War.

#### Death

WALTER S. FRISBIE,\* Chief of the Division of State Coöperation, Food and Drug Administration, Federal Security Agency, Washington, D. C., died suddenly on February 19 after a heart attack while at work. Entering the federal service in 1921 as Chemist in charge of the Office of State Coöperation, he advanced to the position which he held at the time of his death, in which he was widely known among officials engaged in food and drug control work. A graduate in 1901 from Yale, he had pursued graduate studies in chemistry at Yale, Cornell, and Johns Hopkins. He had previously served in Iowa and Nebraska. He became a member of the Association in 1925 and a Fellow in 1930 and was identified with the Food and Nutrition Section. He was Vice-Chairman of the Food and Nutrition Section in 1936, Chairman in 1937, and for a number of years a member of the Committee on Research and Standards.

#### CONFERENCES AND DATES

American Academy of Pediatrics—Region I. Hotel Bellevue-Stratford, Philadelphia, Pa. April 1-3.

American Academy of Political & Social Science. Philadelphia, Pa. April 10-11.

American Association for Social Security. New York, N. Y. April 10-11.

\* Fellow A.P.H.A.

† Member A.P.H.A.

- American Association of Industrial Physicians and Surgeons, and the American Industrial Hygiene Association—Joint Annual Convention. Gibson Hotel, Cincinnati, Ohio. April 13-17.
- American Association of Social Workers—Delegate Conference. New Orleans, La. May.
- American College of Physicians. Public Auditorium. St. Paul, Minn. April 20-24.
- American Congress on Obstetrics and Gynecology—Municipal Auditorium, St. Louis, Mo. April 6-10.
- American Home Economics Association. Boston, Mass. June 21-24.
- American Library Association. Milwaukee, Wis. June 21-27.
- American Medical Association. Convention Hall, Atlantic City, N. J. June 8-12.
- American Psychiatric Association. Hotel Statler, Boston, Mass. May 18-22.
- American Public Health Association—71st Annual Meeting. Headquarters, Municipal Auditorium, St. Louis, Mo. October 27-30.
- American Society of Civil Engineers—Spring Meeting, New Orleans, La. April. Summer Meeting, Spokane, Wash. July.
- American Society of Planning Officials—Joint Conference with National Conference on Planning. Indianapolis, Ind. May 24-28 (tentative).
- American Water Works Association—Indiana Section—Purdue Memorial Building, Lafayette, Ind. April 9-10.
- Canadian Section—General Brock Hotel, Niagara Falls, Ontario Canada. April 15-17.
- Montana Section—Placer Hotel, Helena, Mont. April 17-18.
- Southeastern Section—Savannah, Ga. April 20.
- New York Section—Hotel Niagara, Niagara Falls, N. Y. April 30-May 1.
- Pacific Northwest Section—Marcus Whitman Hotel, Walla Walla, Wash. May 7-9.
- Ohio Section—Commodore Perry Hotel, Toledo, Ohio. May 14-15.
- Annual Convention—The Stevens Hotel, Chicago, Ill. June 21-25.
- Dental Health Week. May 1-8.
- Georgia Public Health Association, Atlanta. May 28-30.
- Iowa Public Health Association. Des Moines. April 13-14.
- Institute of Food Technologists. Minneapolis, Minn. June 15-17.
- May Day—Child Health Day. May 1.
- Michigan Public Health Association. Grand Rapids. November 11-13.
- Missouri Public Health Association. Kansas City. May 7-9.
- National Association of County Officials. Hollywood, Calif. May 20-23.
- National Association of Housing Officials. Baltimore, Md. May 11-13.
- National Boys and Girls Week. April 25-May 2.
- National Conference of Social Work. New Orleans, La. May 10-16.
- National Council of State and Local Public Welfare Administrators. May.
- National Education Association. Denver, Colo. June 28-July 2.
- National Gastroenterological Association. Biltmore Hotel, New York, N. Y. June 3-4.
- National Negro Health Week—28th Anniversary. April 5-12.
- National Organization for Public Health Nursing. Biennial Convention. Palmer House, Stevens Hotel and The Coliseum, Chicago, Ill. May 18-22.
- National Tuberculosis Association—38th Annual Meeting, held jointly with American Trudeau Society—37th Annual Meeting, and National Conference of Tuberculosis Secretaries—20th Annual Meeting, Hotel Bellevue-Stratford, Philadelphia, Pa. May 6-9.
- New England Health Institute. Providence, R. I. April 21-23.
- New York State Association of Public Health Laboratories—26th Annual Meeting. Mary Imogene Bassett Hospital, Cooperstown, N. Y. May 18.
- Pan-American Congress on The Child—8th Congress. Washington, D. C. May 2-9.
- Pennsylvania Public Health Association—Seventeenth Annual Meeting. Pittsburgh, Pa. May 15.
- Smoke Prevention Association. Cleveland, Ohio. May 17-20.
- Special Libraries Association. Los Angeles, Calif. June 1-5.
- Tennessee Public Health Association. Nashville. September.
- Western Branch, A.P.H.A. Seattle, Wash. May 27-29.

#### Canada

- Canadian Federation of Mayors and Municipalities, Ottawa, Ontario. Probably April.
- Canadian Medical Association. Jasper Park Lodge, Jasper Park, Alberta, Sask. June 15-19.
- Canadian Public Health Association. Royal York Hotel, Toronto, Ont. June 1-3.

#### Foreign

- Mexican Congress of Internal Medicine. Mexico City, Mex. May 3-10.

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## A Mock Epidemic of Typhoid Fever Used in Public Health Training\*

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THE W. K. Kellogg Foundation has been coöperating for a number of years with the citizens of seven counties in southwestern Michigan—Allegan, Barry, Branch, Calhoun, Eaton, Hillsdale, and Van Buren—in a joint effort to improve the health, happiness, and well-being of children. This program is called the Michigan Community Health Project. It is built around the seven county health departments.

Few health officers have any actual experience with epidemics. No way exists to test plans, or technics, or to gain experience in the proper use of the necessarily extraordinary powers invoked at such times. In a real epidemic mistakes are costly, often tragic, and decisions have to be made under tremendous pressure. This is also true of war, and yet military forces are trained in actual maneuvers in war games. Could similar technics be developed to make mock epidemics useful in staff training?

The seven county directors agreed that an experiment should be tried. A Foundation executive was asked to arrange the problem, all details of which were to be secret except the date of onset. An army medical officer was invited to help prepare and direct the problem to provide both a broad experience in epidemiology and laboratory methods and a knowledge of war game technics.

### OBJECTIVES

General objectives were discussed. Could a mock epidemic—

1. Train public health personnel for their respective rôles in epidemics?
2. Point out potential local channels through which epidemics could spread?
3. Test the adequacy and quality of facilities including laboratories?
4. Educate community groups to their public health responsibilities?

Typhoid fever was chosen for the first experiment. This decision was carefully guarded. Secrecy was necessary if the difficulties that exist in epidemiological investigation were to be reproduced even in part.

\* Read before the Epidemiology Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 17, 1941.



munities for potential danger spots. Many possible channels of infection known to the problem directors were eliminated by the health departments during this period.

The problem directors gave their preparations a final check in August. Necessary supplies were obtained. Arrangements were completed for a laboratory for the preparation of specimens. Guest books were left at roadside stands and resorts to be signed by all patrons during the period of theoretical exposure. Cases to be released were spotted on maps. A master chart was prepared for the problem directors which gave the exact times and methods to be used in releasing the cases and special instructions applying to the general situation. The case histories were keyed to this chart with a code number and filed in envelopes to be given the control agents of the appropriate counties on the dates specified. Procedures were outlined and instruction sheets made ready. New stories were prepared so that the public could cooperate on an intelligent basis and not misunderstand the project.

The preparations were complete.

#### THE SPARK

About the middle of August, a dinner meeting was held for food handlers from all seven counties. The program included a discussion of milk production and the importance of the food handler in the control of communicable disease. Later, members of the health department staffs were excused from the meeting, and after the food handlers were pledged to secrecy, the proposed mock epidemic was described and its purpose explained. All those present agreed enthusiastically to cooperate with the problem directors and to furnish health department investigators with complete information regarding their activities if called upon.

The menu included a number of

old epidemiological favorites—cottage cheese, roast turkey with oyster dressing, whipped potatoes in cream, mashed squash, tossed salad, a chocolate éclair, and milk. Each person at the dinner signed his printed menu, scratched out any items he had not eaten, and turned it in. This record of food actually eaten by guests was made to establish definitely exposure to the theoretically infected food and to serve as a control over later epidemiological investigations.

On August 31, Colonel Fox arrived. A meeting was held with the fellows in public health engineering who were to serve as control agents and laboratory agents. Supplies were distributed and these men took their posts in the counties. The problem had begun.

#### THE EXPLOSION

From September 1 through 4, several cases of diphtheria, chicken pox, and other communicable diseases were reported to each county health department. These reports had no connection with the real problem. They prevented immediate identification of the nature of the epidemic, and served as a check on the efficiency of the control and reporting system. During this same period 10 cases of typhoid fever were also reported. These 10 cases were scattered through the counties and had one factor in common—they had all attended the special food handlers' dinner in August. Of some 323 guests invited to attend from the seven counties, approximately 40 theoretical cases of typhoid fever eventually developed.

Sporadic cases occurred in all counties. Some of these cases were in health department personnel, requiring transfers of responsibilities. Some caused alarm and apprehension concerning the possible development of secondary outbreaks which failed to appear.

Four secondary outbreaks became manifest due to ambulant or walking typhoids who contracted infection at

the dinner but remained on duty in dairies and food establishments. Outbreaks occurred in two raw milk dairies. A food handling outbreak resulted from a service club dinner, and a massive infection in a large children's home produced secondary cases in spite of previous immunization. One roadside restaurant spread the infection to distant points through tourists and bus travellers. The guest book showed that individuals from 32 states and Canada and points as far away as Shanghai, Rio de Janeiro, and the Canal Zone were exposed during the few days involved.

The mock epidemic was getting nicely started when the field exercise was terminated at 6:00 P.M. on September 10.

#### THE MACHINERY BEGINS TO WORK

Coöperative individuals who had attended the August dinner reported themselves ill to the health department or were reported by IMPersonated physicians. Field investigations were made exactly as though the persons were really sick. Epidemiological reports cleared through the control agents. Supplementary case histories were delivered. Empty, properly labelled containers were turned in, giving notice of intention to take laboratory specimens. After due lapse of time the laboratory agents returned these containers to the health departments with specimens appropriate for the predetermined theoretical case histories. Laboratories ran the specimens in the usual way. The health directors wrote out specific orders for control measures and filed them with the control agents, who brought them in to the judges in the evening.

The essential facts about the reported cases were quickly pooled by the seven county health officers, and the connection with the food handlers' dinner in August was shortly established.

#### STUDENT TRAINING

A fellow in public health administration was asked by the county directors to investigate the food handlers and the food served at that dinner. He made a complete investigation of the hotel, pastry shops, and other places involved, including the ice plant. He uncovered cross-connections, incomplete pasteurization of the milk products, and other interesting potential hazards. Each item of the food was traced, and occasionally conditions were experimentally reproduced. For example, another turkey was prepared in the same kitchen. Temperatures were taken of the oyster dressing both during the preliminary cooking and while the turkey was being roasted. Results showed that the processes used would not kill any pathogenic bacteria present. Theoretical specimens were taken of all food handlers who had helped prepare the dinner. The infection was finally traced to a man who prepared the filler for the chocolate eclairs.

#### LABORATORIES

The problem tested the regular county laboratory facilities as well as the health department's knowledge of how to use them. One laboratory was swamped with routine analyses, and confirmation tests were difficult to obtain when they were most needed. Laboratory technics were brought up to date. New media for making shorter differential diagnoses were tried out.

After enough samples had been run through the county laboratories to serve the purpose, the IMP state laboratory undertook to do all the laboratory work on paper without actual samples, but with proper time allowance. One of the problem directors took the place of the laboratory director and reported the scientific results directly to the county directors. This made it possible to evaluate the health director's interpretation and use of such data.

The exercise demonstrated the need for additional laboratory services in the area in time of epidemics.

#### THE PRESS

To test the ingenuity of the county directors in dealing with a hostile press, scare stories were released in extras, sample copies of which were actually run by cooperating newspapers and placed on the desk of the director without warning. The staffs then had to deal with a theoretically excited public and antagonistic press.

#### RECORDS

During the last two days of the problem, the health departments were required to work only from their own office records so that the value and completeness of these records could be tested. During this stage raw milk routes became involved. The elimination of field visits kept the customers from being unduly alarmed as a result of the health department's activities.

#### EDUCATION OF MILK DEALERS

Visits were made, however, to the milk plants involved, and the conditions that had theoretically developed were explained when the histories were taken.

One dairy found to its chagrin that its recording thermometer had broken down and there were no records to prove that pasteurization had occurred during the days when the milk might have carried the disease to their customers. For the first time the manager understood how this device protected him as well as the public.

Many food handlers who were quite conscientious about not working when they were sick had not recognized the danger of passing on an infection during the incubation or pre-symptom stage or the potential danger of a healthy carrier.

Under the emphasis and enthusiasm

of the game in which they took part, the lay people understood the need for the health department regulations as they never had before.

#### LAWS OF CHANCE

The use of real people proved of inestimable value in producing unpredictable situations. For example, one secondary outbreak was caused by the fact that no control measures were taken at a resort since the cook who had attended the August dinner had resigned and had been replaced by another person. The hurried investigation made by the health department failed to disclose that the cook had stayed long enough to expose a large number of people at a 3 day meeting, and a second outbreak occurred. Events of this type gave the problem a realism that could be achieved in no other way.

#### JUDGES EVALUATE METHODS

The judges reviewed the action taken by the invading organisms and the health department staffs each day. They traced the epidemic on their own charts and prepared statements on the relative effectiveness of procedures chosen by health departments for control. These comments formed the basis of the discussion at the staff critique on the day following the conclusion of the problem.

#### CRITIQUE

This critique was attended by the judges, the problem directors, county health directors, the Foundation consultants, the Michigan State Health Commissioner, and representatives of the U. S. Public Health Service. A history of the outbreak as it would have been officially recorded was presented by the problem directors, illustrated with complete charts and tables. The judges led the discussion of the relative effectiveness of the various

suitied to serve as indices of sanitary quality for Connecticut market cream.

During that part of the study previously reported, the samples (approximately 75 per cent of the final total) were plated in triplicate, using "Standard Methods" glucose tryptone skim milk agar. One set of plates was incubated at 37° C. for 48 hours; another set, at 55° C. for 48 hours; a third set, at 8° C. for 4 days. Charts of recording thermometers indicate that the 37° C. incubation was actually conducted within the range 35°–37° C., with the upper limit a maximum reading never recorded during more than a small fraction of the incubation period. The remaining cream samples (25 per cent) received this same treatment, supplemented by a fourth set of plates incubated at 20° C. for 48 hours. Direct microscopic clump counts were made on all samples. All the samples of pasteurized cream were inoculated into brilliant green lactose bile (2 per cent) for the determination of coliform organisms and were tested for phosphatase.

The cream samples were of three types:

1. Raw retail cream samples. These had received no heat treatment.

2. "Import" cream samples (many pasteurized or heat-treated at the source). It is required by law that these be pasteurized within Connecticut before being offered for sale on the retail market, whether or not they have been pasteurized elsewhere.

3. Retail pasteurized cream samples. These include both cream produced locally and im-

ported cream after pasteurization in Connecticut. A considerable proportion of the latter group may have been repasteurized.

Table 1 shows the percentage of samples which failed to meet the standards (exceeded a limiting value of 500,000 per ml.). The legal plate count standard at 37° C. for 48 hours in Connecticut is 500,000 colonies per ml. and in this study we have accepted that figure as the limiting value for plate counts made at the other temperatures, and for microscopic clump counts.

The direct clump count failed many more samples than did plate counts at any temperature except in the case of the small number (40) of raw retail cream samples for which a 20° C. plate count gave results comparable to the clump count. The percentage of failures by the clump count was relatively uniform for all three types of samples.

A few samples of frozen cream, some 2 or 3 months old and one 53 weeks old, were included among the samples tested. None of these gave a high count by any method.

The results obtained by the standard plate count at 37° C. would, by themselves, give the impression that good cream was being imported but that raw and pasteurized retail cream was of only fair quality. Judged by this standard, all three types of cream were of much better quality than was indicated by the direct clump counts.

TABLE 1

*Results of Tests on 730 Samples of Raw, Import and Retail Pasteurized Cream*

Test	Raw		Import		Retail Pasteurized	
	Total	% Failing *	Total	% Failing *	Total	% Failing *
37° C.—48 hours plate count	149	30.8	336	12.5	245	24.4
55° C.—48 hours plate count	149	0	336	6.5	245	4.8
20° C.—48 hours plate count	40	47.5	138	28.2	84	29.7
8° C.—4 days plate count	149	29.5	336	19.0	245	30.2
Direct microscopic clump count	149	45.6	336	44.6	245	53.8
Tests for coliform organisms	...	....	302	59.2	217	72.3
Phosphatase test	...	....	310	4.1	234	12.3

\* Having counts over 500,000 per ml.; showing coliforms present in 1 ml. or less; or having phosphatase values greater than 0.05 mg. phenol by the Gilcreas-Davis modification of the Kay-Graham test.

Results of 55° C. plate counts showed the thermophilic group of organisms to be of minor importance, although a slight tendency toward an increased incidence of these forms was observed in the retail pasteurized group. Recalling that much of the cream in this group had been twice subjected to pasteurization, the observed increase was less than had been anticipated.

Results of counts at incubation temperatures of 8° C. and 20° C., contrasted with the findings by 37° C. incubation, indicated the presence in the samples of appreciable numbers of organisms capable of growing at refrigerator temperature but probably having optimal growth temperatures confined to the lower portion of the range ordinarily assigned to the mesophilic bacteria (in the neighborhood of 20° C.). This is particularly true of samples giving high counts. Limitations of time and facilities made it impossible to make plate counts at 32° C. but it is improbable that this variation from the 35°–37° C. range would have effected any change in these conclusions.

The results of the tests for coliform organisms seem to indicate that an undesirable situation must have prevailed generally in the handling of market cream after pasteurization, since the phosphatase tests did not show a surprisingly high percentage of under-processed cream. It is very significant that the results of the direct counts reflected this situation to a much greater degree than did plate counts at any temperature.

The type of flora found in the high count cream samples deserves special notice. Samples with high direct counts but low plate counts showed a mixed flora on direct examination, but the majority were observed to contain forms simulating the vegetative cells of spore-forming rods, often in large numbers. The same morphological type of organism was frequently observed also in

samples giving both high clump and high plate counts. Organisms isolated from plates incubated at 8° C., 20° C., and 37° C. were not, however, of this type but were usually of three groups: lactic types, coliforms, and pseudomonads. This last group was isolated frequently from the 20° C. plates but very seldom in large numbers from any one sample.

In the case of pasteurized samples, these observations could be explained in one of the two following ways: (1) The rods observed in direct smears were organisms which had been killed by pasteurization but had retained affinity for methylene blue; or (2) these were live forms, incapable of growth under incubation conditions to which they were subjected. It is pertinent that like forms with similar behavior were found in raw cream, although in fewer numbers. If these were viable forms of sporogenic bacilli, as their morphology suggested, the failure to initiate growth on "Standard Methods" agar is not surprising, since the reaction of spore-formers to a changed environment is little understood and entirely unpredictable unless confined to a narrow range of experimental conditions.

#### • SPORE FORMERS IN MARKET CREAM

It was decided to test certain of the factors influencing the development of spore-forming rods occurring under market conditions in cream. The inoculation of pure cultures into sterile cream was not considered of as much value as a study of behavior of sporogenic types comprised in the "natural" inoculum. Therefore, a series of cream samples was heated to 80° C., held there for 30 minutes, and then cooled immediately. A microscopic clump count was made on each sample, which then was divided aseptically into two portions. One portion was placed in the icebox (6–8° C.); the other was incubated at room temperature. The portions of cream held

in the icebox were examined by direct count at the end of 24, 48, and 72 hours, and at the end of the 6th and 7th day. Microscopic clump counts on the portions held at room temperature were made at hourly intervals during the first 11 hours and also after overnight incubation (about 21 hours). The results of this experiment are summarized in Table 2.

observed was the same as that found after storage at room temperature. Certain samples (979, 980, 981, 984), however, showed no increase in count when held for a full week in the refrigerator, but in every case these were samples containing relatively few resistant forms originally as shown by low counts made immediately after heat treatment.

A further observation may be made

TABLE 2

*Effect on the Direct Microscopic Clump Count of Heating Cream at 80° C. for 30 Minutes and of Subsequent Incubation at Room Temperature and at 8° C.*

Sample Number	Before Heating	After Heating	Direct Microscopic Clump Count per ml.							
			Incubation at Room Temperature for					Incubation at 8° C. for		
			3 hr.	6 hr.	9 hr.	11 hr.	21 hr.	48 hr.	6 da.	7 da.
979	20,000	20,000	20,000	20,000	2,060,000	12,360,000	100,000,000 Over	20,000	20,000	20,000
980	240,000	40,000	20,000	140,000	1,640,000	9,040,000	100,000,000 Over	20,000	20,000	40,000
981	180,000	20,000	20,000	60,000	3,660,000	22,000,000	100,000,000 Over	20,000	20,000	20,000
982	1,200,000	60,000	520,000	1,140,000	1,110,000	8,280,000	6,060,000	20,000	60,000	12,000,000
983	4,320,000	2,640,000	1,860,000	5,840,000	3,300,000	10,200,000	16,200,000	6,600,000	7,800,000	9,600,000
984	1,400,000	120,000	20,000	140,000	200,000	2,240,000	100,000,000 Over	20,000	20,000	20,000
985	80,000	20,000	20,000	20,000	20,000	800,000	24,000,000	20,000	2,660,000	2,800,000

The microscopic picture presented by the heated cream when held at room temperature was that of spore-forming bacteria undergoing rapid vegetative development. The first sharp rise in numbers occurred sometimes as early as the 6th hour, sometimes at the end of 8, 9, or 10 hours. As the count increased, the number of organisms per clump also increased. The similarity of the organisms to those previously described as present in market cream was striking. The morphological types of bacilli which developed during room temperature incubation of these heated samples grew well on plates incubated at 20° C.

The ability of certain of these spore-forming organisms to grow in cream at low temperature (6–8° C.) is shown beyond question of doubt by samples 982 and 985. The type of organism

from Table 2, with regard to the staining behavior of organisms after being subjected to killing temperatures, by comparing direct counts made before heating the cream with counts made afterward. With the exception of sample 979, which had a low count in the beginning, all samples showed a reduction in the number of clumps of bacteria capable of taking the stain. The reductions ranged from 39 to 95 per cent depending, apparently, upon the number of organisms in a heat-resistant stage at the time of heating. Similar reductions in direct counts have been noted in our laboratories in milk samples subjected to laboratory pasteurization.

#### DISCUSSION

Determination of the sanitary quality of cream can conceivably be made by

using one or more of three general procedures: (1) Enumeration of the total bacterial population, (2) enumeration of special types of bacteria, or (3) determination of the degree to which bacterial growth has affected the product. This study is concerned primarily with the first procedure, since the others, although valuable, are but supplementary to it.

So long as the method chosen for enumeration of total bacterial population is rigidly standardized, precise enumeration need not be the ultimate goal. On the other hand, it is essential to have reasonably accurate knowledge of the extent to which results of a laboratory test must be qualified. It is our contention that the direct microscopic count offers the most logical and most fundamental approach to the problem and that its use will result in better control of the product under test by furnishing knowledge of the types of organisms responsible for an unsatisfactory product.

All plate counts, whether made under conditions specified in "Standard Methods" or under modified conditions, have limitations which can exercise an effect over a range too broad and unpredictable to permit a sufficiently exact interpretation of results. Our results indicate that selection of lower temperatures for incubation of plates made from cream samples results in counts more nearly in agreement with the direct microscopic clump count.

Objection may be raised concerning the validity of a direct count on a sample which has been subjected to pasteurization. The single strong objection to this method is the possibility that killed bacteria may be counted. While this objection cannot be discounted entirely in the absence of experimental evidence to the contrary control officials regard it too seriously since the aim of control is as much to subject a good product to pasteuriza-

tion as to insure a satisfactory and safe final product.

In answer to this objection, our results suggest that the average period of cold storage of samples prior to examination in a public health laboratory establishes conditions under which only a minimum number of bacteria of questionable viability will stain. In our experience, borderline microscopic counts are rarities if a standard of 500,000 clumps per ml. is used. Counts are either well below or far above that figure. This is significant when we consider the experimental work on milk of Hastings and Dayenport<sup>4</sup> who demonstrated that a decrease in microscopic count occurs after pasteurization, that the decrease in many cases is a large one and that further decrease may occur during storage at low temperatures.

Even when the phosphatase test proves pasteurization to have been performed effectively, a high direct count on a cream sample justifies one of the following conclusions: (1) The product was of poor bacteriological quality when sampled, as a result of improper handling, or (2) it was an inferior product before pasteurization. Either of these conclusions provides adequate reason for control officials to require corrective action. The results of tests for coliform organisms on the series of samples included in this study lead us to believe that the former conclusion will, in general, prove to be more probable. In our study, coliform organisms were present in market cream to an extent which cast serious doubt upon the efficiency of methods of handling and storing following pasteurization. This is not surprising, since no regulations are in effect in Connecticut to require refrigeration of cream at all times between pasteurization and sale or to limit the age of cream which may be offered for sale. Consequently, chances of bacterial multiplication are often as great in pasteurized cream as in raw cream particularly

if thermoduric mesophiles are present.

The demonstration in direct counts on cream of organisms morphologically similar to the sporogenic bacilli is strikingly similar to observations made on milk by Robertson, Yale, and Breed.<sup>5</sup> Those authors were unable to grow these organisms from pasteurized milk by ordinary plating methods, although their presence was noted in direct smears.

We have shown that market cream may contain considerable numbers of spore-forming organisms in a heat-resistant stage, but in no case were we able to isolate by plating methods more than an occasional spore-former, even though large numbers of colonies were fished and examined. Therefore, we believe the direct microscopic count is the best method for detecting these bacilli, which we have shown capable of producing in cream enormous numbers of progeny, in the absence of or even in the face of storage at refrigerator temperatures.

#### SUMMARY AND CONCLUSION

Results of a comparative study of methods for the enumeration of bacteria in raw and pasteurized cream offered for retail sale indicate that the direct microscopic clump is the most satisfactory and practical method for this purpose, especially if the sample, when pasteurized, is supplemented by a coliform determination and a phosphatase test. The standard plate count (35°–37° C. incubation) is less satisfactory than plate counts made at incubation temperatures of 8° C. and 20° C. Plate counts at 55° C. for thermophilic organisms were of significance for certain samples but had little value for routine testing.

Experimental evidence is cited to show that market cream may contain appreciable numbers of sporogenic bacilli able to survive for 30 minutes at temperatures considerably higher than that of pasteurization. These organisms are capa-

ble of rapid development in cream at room temperature (20° C.) and in many cases, of multiplication at a somewhat slower rate at refrigerator temperature (8° C.). These organisms are detected by a direct microscopic count, but do not ordinarily produce colonies on plates of "Standard Methods" agar incubated at 8° C., 20° C., or 37° C., and only rarely develop at 55° C. Consideration of the manner of distribution of cream on the retail market in Connecticut shows these observations to be of great importance.

The contention that bacteria killed by pasteurization may be counted by the direct method is of little practical significance when consideration is given to the fact that direct clump counts are almost invariably either well below or far above fair limiting values for judging sanitary quality. A direct count in millions per ml. indicates that a cream either contains an extremely large number of viable bacteria or was an inferior and unsanitary product before pasteurization. Furthermore, when large numbers of sporogenic rods are present, it is probable that the bacteria observed are viable, since pasteurized cream is very frequently distributed under conditions which are favorable to the growth of these thermoduric bacteria.

The main advantage of the direct count over the standard plate count, besides ease of manipulation, is the procurement of data on types of organisms present, giving directional guidance to corrective control measures. Furthermore, in a large number of cases, the results of the direct count agree with results of coliform tests that indicate improper handling after pasteurization when plate counts seemingly indicate cream of good quality.

Considering the advantages and the limitations of the direct microscopic clump count as contrasted with those of a standard or a modified plate count, the direct count is superior as an index



of the sanitary quality of market cream, whether raw or pasteurized.

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## San Francisco's Pasteurization Ordinance Finally Upheld

IT has been reported by J. C. Geiger, M.D., Director of Public Health in the City and County of San Francisco, that an ordinance banning the sale of milk in San Francisco, except certified, unless it was pasteurized, which was passed in 1933 by the Board of Supervisors, was finally upheld as a proper exercise of the police power by a decision of the Supreme Court of California rendered April 2, 1942.

Outlining the development of this legislation, Dr. Geiger stated that the request for the pasteurization of all milk supplies, except certified, was brought to a focus by the situation existing in San Francisco in 1932, at which time approximately 2 to 3 per cent of the fluid milk supply was of a raw grade designated as guaranteed, and that tuberculin testing of animals was not universal or complete.

The Director of Public Health barred the distribution of guaranteed raw milk because of the fact that the inspection given by the Department of Public Health to dairy farms producing this type of raw milk was inadequate and, therefore, the production, handling, and distribution of guaranteed raw milk created a potential danger to the public health. Under the then existing condi-

tions, sufficient personnel to cover the duties imposed on inspection services necessary to safeguard the production, handling, and distribution of raw milk was not available. In the case of the production, handling, and distribution of certified milk, the inspection service provided by the Milk Commission of the San Francisco County Medical Society was entirely adequate, and the inspection service was frequent and performed by dairy veterinarians and physicians. This type of milk was later pasteurized and finally voluntarily eliminated.

The Natural Milk Producers Association, an organization composed of grade A raw and guaranteed raw milk producers, contested the ordinance of 1933 banning the sale of raw milk, except pasteurized, by applying to the Superior Court for a permanent injunction. This was denied in 1933. In 1938 the Superior Court upheld the ordinance and in 1941 the District Court of Appeals unanimously affirmed this decision. In upholding the provisions of the ordinance the Supreme Court in its 1942 decision stated: "It cannot be doubted . . . that the requirement that all milk for human consumption be pasteurized is a proper police regulation."

# The Nasopharyngeal Swab in the Diagnosis of Pertussis\*

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BRADFORD, Slavin, and Brooks<sup>1, 2</sup> have adapted the nasopharyngeal swab, which has been routinely used in the diagnosis of pneumonia, to the diagnosis of pertussis. The purpose of this communication is to compare the results obtained by this new method with that of the cough plate originally described by Chievitz and Meyer<sup>3</sup> in 1916. There have been numerous reports on the latter method.<sup>4-17</sup> It has been found highly satisfactory in the hands of the experienced but has not come into general use. Difficulties have been (1) inducing a cough at the time one has the plates (particularly difficult in infants), (2) transporting the plates, and (3) identifying *Hemophilus pertussis* on a plate crowded with colonies of other microorganisms. Another common problem is that of having sufficient sheep or horse blood available to make the media.

The nasopharyngeal applicator advised by Bradford and Slavin and used by the writers is "a small bit of cotton tightly wrapped about the end of a thin, flexible copper wire." It is passed through a nostril into the nasopharynx. Therefore, it must be much smaller than the usual swab used for taking nose and throat cultures for diphtheria. Great gentleness is required. The child's head

must be immobilized. If resistance (a large turbinate, deviated septum or adenoids) is encountered, the applicator should be withdrawn and inserted in the other nostril. It is, of course, sometimes quite impossible to pass even the smallest applicator.

The insertion of the applicator into the nasopharynx very often induces coughing. The applicator should be left there for two or three of the coughs. Incidentally this procedure is a very effective one for obtaining well exposed cough plates. We have usually exposed them at this time. The applicator is then withdrawn and placed in a sterile test tube.

Petri dishes of Bordet-Gengou medium (the same as used for cough plates) are then inoculated lightly by touching the medium three times with the applicator. A sterile platinum loop is used to "dolly" across the medium through the spots inoculated. We have routinely inoculated two dishes with each swab. If a purulent nasal discharge is present, the medium is touched only once with the contaminated swab and preferably more than two dishes are inoculated.

The cough plates herein reported were taken in duplicate on only about half of the individuals tested. If duplicate plates had been taken with more regularity, our results with them would have been better.

\* Read before the Laboratory Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 17, 1941.

The medium we have used is described in the footnote.\* We do not wish to go into the merits of the various formulae described. Ours is essentially that used at the Serum Institute in Copenhagen. The inoculated plates are examined after 2, 3, or 4 days of incubation. Colonies are selected for staining by their pearl-like, shiny appearance when the media is tilted toward a desk lamp in a darkened room. All strains isolated were identified by the usual cultural methods. Agglutination tests were performed only occasionally.

pected in a public health unit where tests were made by a large number of individuals.

Table 1 summarizes the results of 210 comparative tests on 152 cases of pertussis seen during the past 17 months. The recorded cases which were bacteriologically negative were diagnosed on the basis of typical clinical findings. There is no doubt that we missed the diagnosis in some atypical cases of pertussis, for a number of bacteriologically proven cases were very mild or atypical. These latter cases of *Hemophilus pertussis* in-

TABLE 1

*A Comparison of Results with Cough Plates and Nasopharyngeal Swabs  
210 Tests on 152 Cases in which Both Cough Plate and Swab Were Used*

Week of Disease	<i>Both</i>			<i>Both</i>			% + By Swab	% + By Plate	% + By Both
	<i>Plate + Swab +</i>	<i>Plate + Swab + Swab -</i>	<i>Swab + Plate -</i>	<i>Plate - Swab -</i>	<i>Total</i>				
1st .....	26	6	13	10	55	71	60	82	
2nd .....	21	4	19	20	64	63	39	69	
3rd .....	4	4	11	20	39	38	20	49	
4th .....	7	3	3	9	22	45	45	58	
5th .....	...	1	4	9	14	...	...	...	
6th .....	...	...	...	6	6	...	...	...	
7th .....	...	1	...	8	9	...	...	...	
8th .....	...	...	...	1	1	...	...	...	
Total ....	58	19	50	83	210	51	37	60	

The nasopharyngeal swab and cough plates were taken by many different physicians and nurses often inexperienced in the procedures. The results therefore are by no means as satisfactory as might be obtained. The percentage of positive cough plates is definitely low as compared to results obtained by other workers.<sup>4-17</sup> On the other hand, our results indicate what might be ex-

fection would have been missed clinically. Two cases of parapertussis have been encountered since this study began. (The authors have recently reviewed 10 cases of this latter infection<sup>18</sup> seen during the past 4 years.)

Confirming the findings of Bradford and Slavin, Table 1 indicates that the nasopharyngeal swab yielded a higher percentage of positive tests than the cough plate. There were 50 tests in which the swab was positive and the plate negative as compared to 19 tests in which the swab was negative and the plate positive. The oft repeated observation that the earlier the cough plate is taken the more likely it will be positive, holds also for the nasopharyngeal swab.

\* Preparation of medium: 500 gm. of peeled, sliced potatoes are cooked until soft in 1 liter of tap water containing 40 ml. of glycerine. The potato mixture is filtered through 4 thicknesses of cheesecloth; 125 ml. of filtrate are added to 12.5 gm. of agar, 5 gm. of neopeptone, and 375 ml. of 0.6 per cent sodium chloride in a 1 liter flask. The medium is sterilized for 30 minutes at 15 lb. pressure. For use, 250 ml. of defibrinated horse blood, slightly warmed, are added to the melted agar, cooled to approximately 45° C. About 20 thick plates of medium can be poured from this volume.

TABLE 2

*The Isolation of Hemophilus Pertussis by Cough Plate and Nasopharyngeal Swab From 154 Cases of Pertussis*

(Some of these cases were not seen until the 5th or 6th week of cough)

	Both Plate + Swab +	Plate + Swab -	Swab + Plate -	Both Negative	Total	Total Swab +	Total Plate +
Number of Cases.....	60	15	38	41	154	98	75
% of Total Cases.....	39	10	25	27	73+	64	49
% of + Cases.....	53	13	34	...	...	87	66

It is also apparent that the use of both procedures is superior to the use of nasopharyngeal swabs alone.

Table 2 lists 154 cases studied and shows the percentage of cases (not the number of tests) which were positive. It should be mentioned that a few of these cases were not seen until the 5th or 6th week of cough. Sixty-four per cent of all cases were positive by swab at some time during their course, whereas 49 per cent were positive by plate. Eighty-seven per cent of the bacteriologically proven cases were positive by swab as compared to 66 per cent positive by plate.

In order to determine the viability of *Hemophilus pertussis* on the nasopharyngeal applicator, a considerable number of the applicators were placed in the electric refrigerator at 2° C. after they had been used to inoculate media. Of 41 applicators which were subsequently found to be positive on the initial streaking, 4 of 11 were again positive after 1 day of refrigeration, 3 of 19 were again positive after 2 days of refrigeration, and 2 of 10 were again positive after 3 days of refrigeration. It is apparent that *Hemophilus pertussis* may occasionally remain viable in mucus imbedded in cotton for 3 days at this temperature. It is also apparent that isolation of the organism is facilitated

by prompt inoculation on media and incubation.

Bradford and Slavin<sup>1</sup> noted that "sometimes the growth from the nasopharyngeal cultures was practically pure." We have also noted this. Very heavy growth is often encountered.

Further studies are being made to determine in particular, (1) the duration of carriage of *Hemophilus pertussis* in the nasopharynx during pertussis, and (2) the presence of *Hemophilus pertussis* in the nasopharynx of contacts.

The advantages of the nasopharyngeal swab technic as compared to the cough plate appear to be:

1. Higher percentage of positive cultures
2. Ease of transportation
3. Speed in obtaining the inoculum

The disadvantage to the method is the discomfort involved.

#### SUMMARY

The nasopharyngeal swab of Bradford and Slavin has been compared with the cough plate in the bacteriological diagnosis of pertussis. Two hundred and ten duplicate tests were made on 152 cases in all stages of the disease. *Hemophilus pertussis* was isolated more frequently by swab than by plate. The use of both procedures, however, was superior to the swab alone.

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# A Comparison of Methods for the Determination of Carbon Monoxide\*

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THE 1940-1941 report of the A.P.H.A. Subcommittee on Chemical Methods in Air Analysis dealt with the determination of carbon monoxide. In the preparation of that report it became apparent that although certain methods were in constant use for the estimation of concentrations of carbon monoxide, very little had been done to evaluate them by comparison with other accepted methods when sampling the same environment. The investigation we are reporting here is an attempt to do this.

Six methods were included in this study. They are the iodine pentoxide method, the hopcalite indicator, the Hoolamite detector, palladium chloride ampoules, the British palladium chloride method, and the pyrotannic acid method.

The carbon monoxide test mixtures were prepared by generating the gas from formic and sulfuric acids. This carbon monoxide gas was then used to make up the carbon monoxide-air mixtures. An empty compressed air cylinder was used to store the carbon monoxide-air.

For the iodine pentoxide method, sampling was accomplished as follows:

The sampling tube A with both stopcocks open is totally immersed in the

water contained in cylinder B. The gas is then allowed to flow in through stopcock C, displacing the water in A. Stopcock C is now closed, the sampling tube A is raised to within about an inch of the surface of the water and then stopcock D is closed. This leaves the gas in the tube under a slight positive pressure. The tube is allowed to come to room temperature and the pressure within the tube is equalized before analysis by momentarily opening the stopcock.

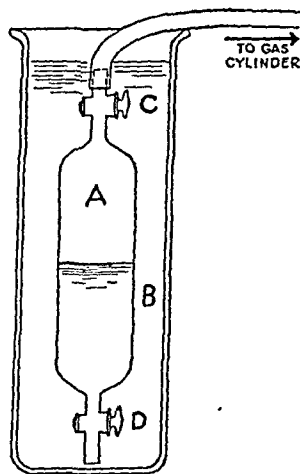


FIGURE 1

The principle of this method is the reaction of carbon monoxide with iodine pentoxide to form iodine and carbon dioxide. The amount of iodine formed is then determined volumetrically.

The iodine pentoxide apparatus itself

\* Read before the Industrial Hygiene Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 15, 1941.

has been slightly modified and the gas sample is analyzed as follows:

Air is drawn through the apparatus from the outside, passing through tube A which is filled with calcium chloride, tube B which contains ascarite, then through 3-way stopcock C, through tube D which contains ascarite, and E which contains magnesium perchlorate, through the liquid air trap F into the iodine pentoxide tube G, and through the iodine absorption tube H. I is a glass stopcock, J is a "T" which serves as a bleeder valve to regulate the rate of flow. The sample in K is drawn up through the stopcock C and continues through the apparatus in the same way as the air. Absorption tubes A, B, C, D, and E are sealed off at the top after being filled. The liquid air trap F was blown in the laboratory. The iodine pentoxide tube G is a Kraissl tube and the iodine is absorbed in a Bowen absorption bulb H.

TABLE 1

Concentration of CO % (by volume)	Sample Tube Capacity in ml.	Ml. of N/1,000 Arsenite Solution
0.01	1,000	1.8
0.03	1,000	5.4
0.10	1,000	18.0
0.25	300	13.0
0.40	150	11.0

It was found that about 75 ml. per minute was a good rate for the introduction of the sample into the iodine pentoxide apparatus, and that 15 minutes was sufficient for flushing. After the apparatus was conditioned by passing air through it and keeping the iodine pentoxide at 200° C., blanks on outside air gave no color with starch and potassium iodide even after running hour after hour and in between determinations.

No difference was observed whether or not the liquid air trap was used. This is of course only true of our syn-

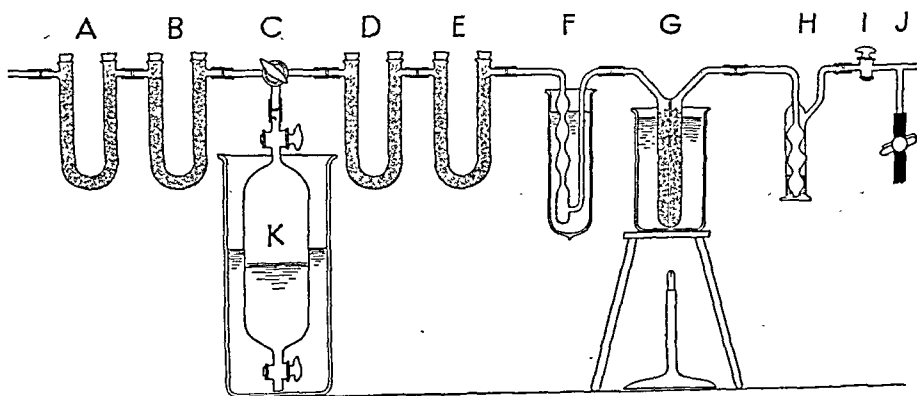


FIGURE 2

Three sizes of sampling tubes were used—150, 300, and 1,000 ml. The volume of N/1,000 sodium thiosulfate or sodium arsenite solution needed for a single titration is given in Table 1.

These values are only approximations and serve to indicate the size of sampling tube that is necessary depending upon the carbon monoxide concentration.

thetic carbon monoxide—air and outside air samples.

Corrections for temperature and pressure make differences in the second decimal place, as for example, 0.250 per cent uncorrected against 0.277 per cent corrected.

The effect of varying concentrations of potassium iodide in the absorber was determined. We found that 20 ml.

solution when less than 25 ml. of solution are used.

These findings were also confirmed when thiosulfate was used instead of arsenite.

Just a word about starch solutions. We found soluble starch satisfactory, provided that it was freshly prepared. The use of a preservative such as toluol affects the titration of dilute iodine solutions and should be avoided. When starch solutions are made up with the addition of KI, the presence of KI will, of course, affect the value of the titration blank. The effect of adding the starch at the beginning or at the end of these titrations of N/1,000 solution with different amounts of KI was studied. It was found that in the presence of 2 per cent KI, the iodine values may be slightly higher if the starch is added immediately. It is better practice to wait until a few ml. of the end point before adding the starch as is usual.

The effect of bubbling CO<sub>2</sub> through the solution during the arsenite titration was also investigated. In the absence of CO<sub>2</sub>, lower values were obtained for the iodine content. It appears, therefore, that CO<sub>2</sub> is necessary for this titration with thousandth

normal solutions and that losses due to volatilization of iodine during such procedure do not occur.

Table 2 is a summary of the results we obtained by the six methods employed. The iodine pentoxide results are regarded as the true values.

The hopcalite indicator values were obtained with the M.S.A. carbon monoxide detector. We used a number of hand driven and battery driven instruments. All canisters and cells were freshly prepared at the outset of these experiments. It is to be noted that this instrument gave very satisfactory results.

We have had considerable experience in servicing these instruments. Necessary repairs included changing canisters, refilling hopcalite cells, seeing that leads to the ammeter are not reversed, getting rid of leaks, cleaning out flowmeter fluid from connection to canister, tightening joints, recharging batteries, etc.

The Hoolamite detector gave consistently higher results at all carbon monoxide concentrations. At 0.01 per cent CO no color was obtained in twenty squeezes <0.05 per cent CO. If it is to be considered as a method at all it is only as a substitute for the canary

TABLE 2

Comparison of Methods for Determination of CO in Air

% CO Approx.	I <sub>2</sub> O <sub>5</sub>		Hopcalite Indicator		Hoolamite		PdCl <sub>2</sub> Read- ings	Am- poule Ave.	Pyrolutanic Acid		British PdCl <sub>2</sub>	
	Read- ings	Ave.	Read- ings	Ave.	Read- ings	Ave.			Read- ings	Ave.	Read- ings	Ave.
0.3	6*	0.277	.....	.....	2*	1.0	.....	.....	.....	.....	5*	1.0
0.3	12*	0.250	.....	.....	0.4-0.65	0.55	.....	.....	.....	.....	.....	.....
0.1	{ 0.123 0.123 0.120	0.122	6*	0.125	0.2-0.5 12*	0.4	3*	>0.10	60-70† 6*	0.12 63†	24*	0.15
0.05	{ 0.0550 0.0550 0.0545	0.055	0.042 0.056 8*	0.050	0.15- 0.30 7*	0.2	8*	0.09	55-65† 6*	0.11 60†	26*	0.06
0.01	{ 0.0111 0.0107	0.0109	0.010 0.014	0.012	.....	<0.05	0.01 0.05	0.03	10-25† 6*	0.013 17†	2*	0.01

\* Number of determinations

† Per cent blood saturation



bird. It probably was not designed to do much more than that.

The palladium chloride ampoules appear to be better than the Hoola-mite detector. Exposures should be timed at 10 minutes since longer exposures were found to darken the color.

The pyrotannic acid method gave a good average value at 0.01 per cent and 0.1 per cent CO. The value obtained at 0.05 per cent CO is twice as high as it should be. Two determinations were made and there were three observers for each determination. The air mixture was checked before and after with the M.S.A. CO indicator and found to be correct. The per cent saturation as read by different observers usually included three standards. This means that for concentrations where the value is very critical, say at 0.01 per cent CO the value obtained may be 100 per cent off, and constitute the difference between having a carbon monoxide hazard and not having one.

The British test paper method, which like the ampoule detector is a palladium chloride method, gave fairly good re-

sults. In the higher concentrations the values became too great. It was found that if the papers were read when wet and standing a little off at a distance, very good comparisons could be made. However, the method is a slow one and requires a considerable number of values for averaging. Reading Table 2 across, we see that at 0.3 per cent CO the iodine pentoxide method is the only reliable method to use. The other values are too high, but all read on the safe side.

At 0.1 per cent CO the hopcalite indicator gives a very good result as do also the pyrotannic and British palladium chloride methods.

At 0.05 per cent CO the hopcalite indicator is the most accurate. The British palladium chloride method also gives a good result, while the others give figures about twice as high.

At 0.01 per cent CO the hopcalite indicator, pyrotannic acid method and British method give good results. All in all, if we consider the time factor and the number of determinations, the hopcalite indicator gives by far the best performance.

# Blood Lead Determinations as a Health Department Laboratory Service\*

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THE Baltimore City Health Department first became interested in lead poisoning in 1929 in an investigation of several cases of industrial lead poisoning. This interest was broadened in 1932 when an outbreak of 40 non-fatal cases of lead poisoning occurred mostly in children as a result of the inhalation of fumes and dust arising from the use of discarded storage battery casings for fuel.<sup>1</sup> Subsequently, for a period of more than four years all cases of lead poisoning which came to the attention of the Health Department were routinely investigated in order to ascertain if possible the source of the lead exposure in both adults and children. Early in 1935, at the request of Dr. Edwards A. Park, Pediatrician-in-Chief at the Johns Hopkins Hospital, the Bureau of Laboratories provided facilities for the quantitative estimation of lead in blood in cases of suspected plumbism. These facilities were soon expanded into a routine service. The usefulness of the quantitative blood lead analysis as an index of abnormal lead absorption had already been demonstrated at that time by the extensive studies of Blumberg and Scott at the Johns Hopkins Hospital<sup>2</sup> as well as by other investigators.<sup>3, 4</sup> Subsequent investigations have further confirmed the value of this

analysis in providing evidence of lead absorption in cases of suspected lead intoxication.<sup>5-14</sup>

Since July, 1935, we have routinely examined more than 1,400 specimens of blood from over 1,000 individuals. The blood lead service has been used by more than 20 local hospitals and by more than 80 private physicians. At the present time approximately 30 specimens of blood are examined each month. No charge is made for this work. It is the purpose of the present report to describe this unique laboratory service and to call attention to the valuable assistance which it has given to our Division of Industrial Hygiene and Bureau of Occupational Diseases in locating lead hazards and in evaluating the extent of lead poisoning in the community.

## COLLECTION OF SPECIMENS

Ten gram samples of whole clotted blood are used in these examinations. In order to minimize contamination, only specimens submitted in prepared containers known as "blood lead outfits" (Figure 1) are accepted for analysis. The outfit consists of a lead-free glass test tube (17 mm. x 91 mm.) stoppered with a clean new XXXX quality Armstrong cork. The tube is first cleaned, then rinsed with nitric acid and lead-free water, and dried. The tube, together with an identification card requesting information concerning the

\* Read before the Industrial Hygiene Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 15, 1941.

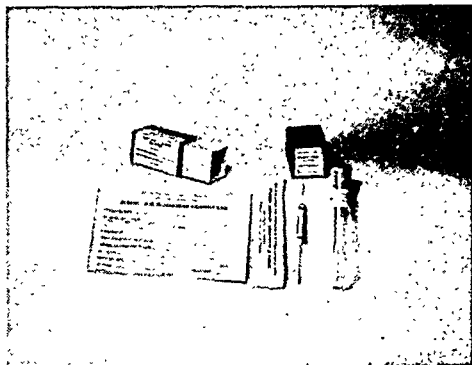


FIGURE 1

name, address, age, sex, color, occupation, and length of exposure to lead of the patient is packed in a distinctive cardboard box bearing the "blood lead outfit" label. Directions for collecting the blood specimen are printed on the reverse side of the card. Recently, the outfit was further improved by the provision of a sterile, lead-free, rustless, 19 gauge, Petroff needle (Becton Dickinson, Number 497N) contained in a small paper envelope. The needle is suitable for adult use only and eliminates the need for a syringe. The cost to us of the blood lead outfit including the needle is  $7\frac{1}{2}$  cents. The outfits are distributed by the Bureau of Laboratories to the local medical profession and hospitals in the same manner as outfits regularly provided for the collection of specimens in cases of infectious diseases.

#### METHOD OF ANALYSIS

It is now well established that traces of lead are normally present in the blood. The difference between normal and abnormal amounts of lead in circulating blood is a quantitative and not a qualitative distinction and requires the use of highly sensitive and accurate means of lead estimation. In this work the modification of the dithizone method described by Wilkins, Willoughby, *et al.*<sup>5, 15</sup> was used. The method was further modified to include

the neutral wedge photometer in accordance with the technic of Clifford and Wichmann.<sup>16</sup>

Meticulous supervision is required. The method is practical only when a sufficient volume of samples is anticipated. In our laboratory, reagents and equipment are available for the simultaneous examination of 6 specimens. This equipment necessitated an outlay over a period of 4 years of more than \$400. However, the average cost of a single examination is estimated at about 25 cents. The figure given does not include the cost of labor. When analyses are made in multiple, the average time required of the analyst for a single analysis is slightly more than 1 hour.

#### REPORTING OF RESULTS

Blood lead concentrations are reported as mg. lead per 100 gm. of blood. Recently, for convenience, the following summary of the interpretation of the blood lead value was printed on the report form which is mailed to the physician.

#### INTERPRETATION OF RESULTS

It is now recognized that in the general population the average lead content of the blood is about 0.03 mg. per 100 gm. In persons with no history of exposure to lead, the blood lead level may range as high as 0.05 to 0.06 mg. per 100 gm. of blood. Higher blood lead values are evidence of abnormal absorption of lead and suggest the relative severity of the recent lead exposure.

Lead absorption is not synonymous with lead poisoning. Experience has demonstrated that individuals in industrial lead exposures may have abnormal blood lead levels with no accompanying symptomatology. A high blood lead level is not, of itself, diagnostic of lead poisoning but must be correlated with other findings, both clinical and laboratory, as well as with a history of definite exposure to lead.

No direct correlation exists between the degree of elevation of the blood lead value and the severity of the symptoms. It should be further noted that in convalescence from lead poisoning the blood lead value may remain in the abnormal range for a considerable period after symptoms have disappeared.

TABLE 1

*Initial Blood Lead Values in Normal Individuals and in Cases of Suspected Lead Poisoning*

Mg. Lead per 100 gm. Blood	Normal Controls	Suspected Lead Poisoning			
		Positive Clinical Diagnosis		Negative Clinical Diagnosis	
		Adults	Children	Adults	Children
0.00	2	..	..	1	..
0.01	8	..	..	10	9
0.02	25	..	..	31	17
0.03	41	..	..	68	40
0.04	39	..	..	79	50
0.05	8	1	..	57	22
0.06	1	6	..	23	19
0.07	1	3	..	8	13
0.08	1	8	1	6	7
0.09	..	9	6	2	..
0.10-0.20	..	46	26	5	..
0.21-0.30	..	3	22	1	..
0.31-0.40	..	5	7	..	..
0.41-0.50	..	..	8	..	..
0.51-0.60	..	1	3	..	..
0.61-0.70	..	..	1	..	..
TOTAL (750)	126*	82	74	291	177

\* Mean normal value 0.031 with standard deviation  $\pm 0.012$ .

If the findings in this report indicate a doubtful result or an abnormal absorption of lead, an additional specimen of blood and also a specimen of urine should be examined. Because of the time and expense involved in making these analyses, physicians must communicate directly with the Director, Bureau of Laboratories, in order to make arrangements for repeat tests.

This interpretation is based on the available literature cited in the above references as well as upon our own experience.

#### SUMMARY OF BLOOD LEAD FINDINGS

At the outset the laboratory service was intended merely to provide practitioners with an aid in the diagnosis of lead poisoning particularly in cases involving infants and young children. The coöperation of the hospitals and private physicians who made use of the laboratory service was solicited in order to make available the clinical histories of those individuals whose bloods had been examined for lead. This investi-

gative work was expanded after the creation of the Bureau of Occupational Diseases in the Baltimore City Health Department in 1936. In this way, an excellent source of information was provided as to the occurrence of both industrial and nonindustrial lead poisoning in the city. In addition a study of the case histories permitted a correlation of the chemical blood lead determination with the clinical signs and symptoms, the history of exposure, and the final diagnosis made in each instance. Case histories of 624 individuals (373 adults and 251 children) have thus far been examined. A distribution of the blood lead values of this group in relation to the clinical diagnoses made is shown in Table 1.

Initial blood lead values only are recorded in this table; values obtained in convalescence or after treatment are not shown. The table also includes a series of specimens from 31 adults and 95 children (126 in all) with no history

of industrial or other exposure to lead. These specimens were obtained through the coöperation of the local infectious disease hospital. The blood lead values in this "normal" group were not significantly different for the adults and children. Since these individuals were not "normal" with respect to health, it is conceivable that metabolic disturbances associated with infectious disease may have slightly elevated the blood lead values of some members of the series.

In the group diagnosed as clinical lead poisoning our data include 82 adults, all but one of whom contracted lead poisoning in the course of their occupations; and 74 children of an average age of  $2\frac{1}{2}$  years, practically all of whom had a history of pica associated with the chewing of objects painted with lead containing paints. In many of the children's cases, analyses were made of paint scrapings to confirm the source of lead. Specimens from all but one of the 251 children were submitted from hospitals. On the other hand, specimens from 30 per cent of the adults were submitted by private physicians.

In plumbism, the most commonly occurring blood lead values in both adults and children was in the range of 0.1 to 0.2 mg. per 100 gm. of blood. Values in excess of 0.2 mg. occurred far more frequently in affected children than in adults.

The group tabulated as "negative clinical diagnosis" consists of individuals whose clinical histories did not show a diagnosis of lead poisoning. Many of the children in this group had a history of pica. Almost all of the adults were engaged in occupations wherein some abnormal absorption of lead might be suspected. Those adults in this category who showed blood lead values in excess of 0.07 mg. were definite examples of asymptomatic lead absorption. These men were engaged

in such occupations as the manufacture of lead paint pigments, the manufacture of lead arsenate, scrap lead reclamation, and lead burning.

#### USEFULNESS OF THE BLOOD LEAD SERVICE AS A HEALTH DEPARTMENT METHOD

The local medical profession is accustomed to asking for a blood lead determination by the Baltimore City Health Department in cases of suspected lead poisoning encountered in their practice. A copy of the result of each analysis is forwarded to the Bureau of Occupational Diseases for investigation. In this way the majority of the actual lead hazards in local industry have been defined and numerous corrections of lead exposures were obtained.

With the reports from the blood lead service as a clue, numerous instances have occurred in the past 6 years wherein outbreaks of industrial lead poisoning were immediately called to the attention of the Bureau of Occupational Diseases and the Division of Industrial Hygiene. An excellent example which has already been cited<sup>17</sup> related to an incident involving several cases of lead poisoning in a manufacturing plant. A cross-connection in plumbing permitted a solution of lead compound to enter the water supply of a drinking fountain in the plant. Numerous other incidents have occurred which involve such diverse occupations as the manufacture of lead arsenate, the manufacture of lead paint pigments, acetylene torch burning in shipbreaking, enamelling with lead-containing frit and the cleaning of tanks which had been used for the storage of leaded gasoline.

In recent years, largely as a result of studies associated with a follow-up of the blood lead laboratory service, it has been possible for the Baltimore City Health Department to acquire relatively accurate information concern-

TABLE 2

*Reporting of Non-fatal Lead Poisoning in Baltimore City, 1931-1940*

Year	Total Non-Fatal Cases	Cases Reported		Cases Not Reported But Ascertained Through Follow-up of Laboratory Service	
		Adult	Child	Adult	Child
1931	..	..	..	..	..
1932	49	12	37	..	..
1933	2	2	..	..	..
1934	4	..	4	..	..
1935	12	1	4	4	3
1936	26	3	..	12	11
1937	24	..	..	16	8
1938	11	2	..	2	7
1939	18	..	..	11	7
1940	26	3	..	18	5
TOTAL	172	23	45	63	41

ing the incidence of lead poisoning in the community.<sup>18</sup> During the past 10 years, all of the known cases of fatal lead poisoning (49 children and 7 adults) were reported to the Bureau of Vital Statistics. However, there has been little tendency to report cases of non-fatal lead poisoning. This fact is strikingly demonstrated in Table 2.

The increased incidence of reported lead poisoning in 1932 is due to the storage battery outbreak mentioned earlier.<sup>1</sup> Beginning in 1935, it will be noted that the Health Department became aware of a large number of unreported cases of non-fatal lead poisoning. This resulted directly from the follow-up of the laboratory service. Only those cases are listed in which an investigation with regard to the history of exposure, signs, symptoms, and laboratory examination furnished evidence to substantiate the diagnosis of lead poisoning.

#### SUMMARY

A description has been given of a blood lead laboratory service which the Bureau of Laboratories of the Baltimore City Health Department has made available to the physicians and

hospitals of Baltimore during the past 6 years. The service has proved invaluable to the Division of Industrial Hygiene and the Bureau of Occupational Diseases in locating lead hazards and in evaluating the extent of both industrial and nonindustrial lead poisoning in the community.

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# The House Fly as a Vector of Food Poisoning Organisms in Food Producing Establishments\*

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THE house fly (*Musca domestica*) has been incriminated as a vector of food poisoning bacteria on many occasions. Classical epidemics of food-borne infections such as the typhoid epidemics among soldiers during the Boer<sup>1</sup> and Spanish-American<sup>2</sup> wars, each of which involved more than 20,000 cases, and the widespread cases of diarrhea in Southend-on-Sea<sup>3</sup> in 1901 were traced to the contamination of food by flies. These and numerous other food poisoning epidemics, in which flies were thought to have been responsible for infecting food supplies, have led many investigators to study the potentialities of house flies as carriers of pathogenic bacteria. A more complete review of the literature and the results of some preliminary experimental data have been reported in a previous publication<sup>4</sup> in which it was shown that flies are capable of depositing on food by defecation or regurgitation countless numbers of bacteria, and further that the bacterial flora deposited is largely determined by the nature of the material on which the flies feed. Flies infected with *Salmonella enteritidis* and allowed to come in contact with sterile pecan meats deposited these

pathogens in large numbers on the pecans left exposed for only 15 minutes.

Since the publication of those data several hundred flies trapped in and around crabmeat producing establishments were found to contain total bacterial counts of 750 million and as many as one million *Escherichia coli* per fly.

In the present study experiments have been conducted with flies using *Salmonella enteritidis* as the test organism to determine the ability of flies to infect other flies, the longevity of the test organism in flies, the transmission of *Salmonella enteritidis* from infected flies to mice, and the ability and extent to which uninfected flies would become vectors of the test organism when exposed to infected mice. Some studies were also carried out on the survival of *Salmonella enteritidis* during metamorphosis from eggs to adult flies.

## EXPERIMENTAL WORK

The methods employed in rearing flies have been previously reported,<sup>4</sup> but briefly are as follows: Eggs are collected on milk- and water-soaked cotton and are suspended in physiological salt solution. This suspension of eggs is poured on the surface of a bran-alfalfa-leaf-meal medium into which is poured and kneaded a mixture

\* Read at a Joint Session of the Engineering and Food and Nutrition Sections of the American Public Health Association at the Seventieth Annual Meeting, in Atlantic City, N. J., October 15, 1941.



consisting of a commercial malt syrup, yeast suspension, and water. Maggots may be allowed to pupate in the top dried-out layers of this synthetic medium or in a pan of sawdust. The emerging flies are trapped in cages. For control purposes, the synthetic mash, developing maggots, and adult flies were examined for *Salmonella enteritidis*.

Since in the following experiments, with *Salmonella enteritidis* as the test organism, it was desirable to reduce surface contamination of the flies to a minimum, two methods of feeding were used. In the first of these a small cylindrical glass cup was filled to within 2 to 2.5 mm. of the top with infected food (10 ml. of an 18 hour broth culture of *Salmonella enteritidis* in equal parts of milk and water). Over this was placed a fine mesh screen. It was intended in this manner to prevent the flies from standing on or falling into the liquid food. In feeding, the fly forced its proboscis through the wire mesh. This method was not as successful as the second method in which a piece of evenly cut blotting paper was placed on a cylindrical feeding cup filled with

the liquid food and this cup, full of food, then inverted over a second empty cup, the blotting paper acting as a separator (Figure 1). If the blotting paper is cut slightly smaller in diameter than the outside diameter of the cup, none of the soaked-up portion of the blotting paper is exposed to cause surface contamination of the flies when they are feeding. Drinking water is provided by covering a small bottle of water with a piece of filter or blotting paper and inverting it over a watchglass, as shown in Figure 1.

#### TRANSFER OF *SALMONELLA ENTERITIDIS* FROM FLIES TO FLIES

Using the second method, approximately 100 flies were fed for 24 hours on milk and water infected with *Salmonella enteritidis*. At the end of the 24 hour period 10 flies were trapped and anesthetized with ether. One wing of each was clipped and the flies placed in a sterile cage with approximately 100 uninfected, unmarked flies. The flies making up this population were fed fresh uninfected milk and water daily. Each day all dead flies and from 10 to 20 live unmarked flies were removed



FIGURE 1—Feeding and Watering Flies: Pieces of filter or blotting paper are placed between the feeding cups and between the water bottle and the watchglass.

and examined by washing for 10 minutes in a mixture of 1 per cent sodium hydroxide, 1 per cent aerazol and 5 per cent formaldehyde, followed by washing from three to five times with nutrient broth. The washed flies were then ground in a sterile mortar and the residue examined for the presence

10 unmarked flies from the second group.

All swabbings from cage surfaces, washings from flies, and residue of ground flies were inoculated into tetrathionate broth and then streaked on bismuth sulfite agar for study. Suspicious colonies were fished and ex-

TABLE 1

*Transfer of Salmonella Enteritidis in Flies*

Cage 1—4 Days—&gt;Cage 2—4 Days—&gt;Cage 3—4 Days—&gt;Cage 4

Examination Made of:	Initial Population: 100 Flies; Fed <i>Salmonella enteritidis</i> for 24 Hours and Then Examined	Ten Infected Flies Transferred from Cage 1 (One Wing Clipped) to Cage 2 Containing 100 Unmarked Uninfected Flies *	Ten Infected Flies, Not Previously Marked, Transferred and Marked from Cage 2 to Cage 3 with 100 Unmarked Uninfected Flies *	Ten Infected Flies, Not Previously Marked, Transferred and Marked from Cage 3 to Cage 4 with 100 Unmarked Uninfected Flies *
Surface washing of flies after chemical treatment	Negative	10 unmarked flies; Negative	10 unmarked flies; Negative	10 unmarked flies; Negative
Intestinal tract of flies †	Positive	Positive	Positive	Positive
Fly food	Positive	Positive	Positive	Positive
Fly water	Positive	Positive	Positive	Positive
Cage surfaces: wood— wire—glass	Positive	Positive	Positive	Positive

\* Fed fresh uninfected milk and water.

† Ground up flies after chemical treatment to remove surface organisms.

Positive = *Salmonella enteritidis*.

Negative = *Salmonella* not isolated.

of *Salmonella enteritidis*. The nutrient broth washings, the food, water, and swabbings of the wood, wire, and glass surfaces of the cage were likewise examined. At the end of 4 days 10 unmarked flies from this first group were anesthetized, marked by clipping one wing, and placed in a sterile cage with a fresh group of 100 uninfected flies. This second group of flies was fed daily on uncontaminated milk and water. All dead flies and from 10 to 20 live unmarked flies were removed from this group daily and, as in the first group, examinations were made of surface washings and macerated flies, the food, water, and of the swabbings of the wood, wire, and glass surfaces of the cage. At the end of an additional 4 days a third population of flies was established in a similar manner, using

aminated. All organisms were identified both biochemically and serologically. The results are shown in Table 1, where it will be noted that surface washings of flies, after chemical treatment, failed to contain *Salmonella enteritidis*. The residue from unmarked macerated flies, taken as an index of intestinal content, was found to contain the test organism in all three populations of flies, thus indicating transfer of *Salmonella enteritidis* from infected to uninfected flies in all three instances. *Salmonella enteritidis* was also recovered from the fly food, water, and cage surfaces in each of the fly populations established. These experiments were repeated twice with similar results. However, in repeating, both methods of feeding described above were used and daily transfers of known infected flies to un-

infected populations were made rather than transfers at 4 day intervals.

#### LONGEVITY OF *SALMONELLA ENTERITIDIS* IN FLIES

To determine the longevity of *Salmonella enteritidis* in flies and the period of time these test organisms would be deposited by defecation, several hundred flies were fed *Salmonella enteritidis* for 24 hours, as described in the previous experiment, after which they were placed in a sterile cage and fed sterile milk and water daily. Several pieces of orange or banana peel were also placed on the floor of the cage daily. At the end of the second day 10 flies were removed for examination, and the remainder were transferred to a sterile cage. The flies removed for study were treated chemically to remove surface organisms and then macerated and tested for presence of *Salmonella enteritidis*. The surfaces of the cage from which the flies were removed and the food and water were also examined for this organism. On the 4th, 5th, 6th, 7th, 10th, 17th, and 20th days this performance was repeated, *i.e.*, on each of these days the flies were examined for *Salmonella enteritidis* and the remaining flies transferred to a sterile cage. Following each

transfer the old cage was examined for contamination with *Salmonella enteritidis*, as were the water and food it contained.

*Salmonella enteritidis* was isolated from the flies on each day examined except the 7th and 17th days. Sporadic recovery of the test organism from the fruit peel, fly food, and water and from cage surfaces occurred throughout the 20 days (Table 2). Although additional flies with which to continue this experiment were not available, the results of related experiments indicated that the test organism could survive for the entire duration of the life of the fly, approximately 4 weeks.

#### TRANSMISSION OF *SALMONELLA ENTERITIDIS* FROM FLIES TO MICE AND FROM MICE TO FLIES

In previous publications<sup>5, 6</sup> it was shown that extremely small inocula (*per os*) of the strain of *Salmonella enteritidis* used in these experiments were necessary to bring about infection and subsequent excretion of the organism in both rats and mice. It was found that approximately seven organisms fed by stomach tube to mice caused a high incidence of fatalities in 13 days or less. To determine the ability of flies to transmit *Salmonella*

TABLE 2

*Longevity of Salmonella Enteritidis in Flies and the Presence of the Test Organism on Cage Surfaces*

Examination Made of:	Day Examined							
	2nd	4th	5th	6th	7th	10th	17th	20th
Fruit peel	+	O	+	O	O	+	+	+
Fly food	+	O	+	O	+	+	O	+
Cage surfaces—wood—wire—glass	+	+	O	+	O	+	O	+
Surface washing of flies after chemical treatment	O	O	O	O	O	O	O	O
Intestinal tract of flies *	+	+	+	+	O	+	O	+

\* Ground up flies after chemical treatment to remove surface organisms.

+ *Salmonella enteritidis* isolated.

O *Salmonella* not isolated.

NOTE: Three hundred flies fed *Salmonella enteritidis* for 24 hours then placed in a sterile cage and examined on days indicated above.

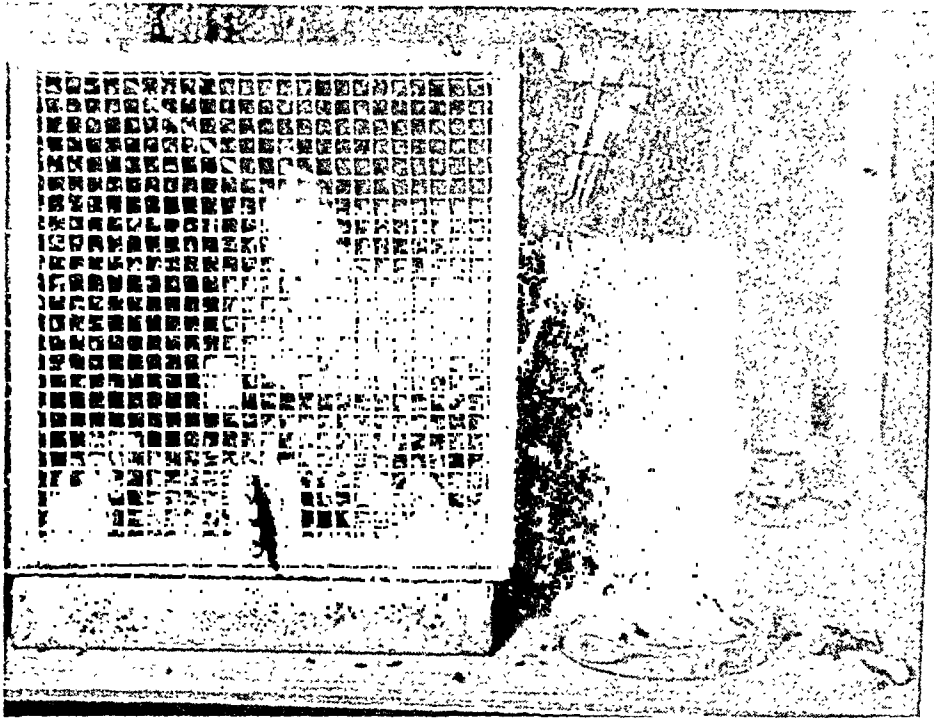


FIGURE 2—*Mice and Flies Caged Together*: The screen bottom of the mouse cage is on an open pan to allow for the collection of pellets.

*enteritidis* to mice or to become vectors of the organism in the presence of infected mice, the following experiments were conducted.

A one day old population of flies was fed for 24 hours on a mixture of an 18 hour broth culture of the test organism in milk and water, after which the flies were placed in a large sterile fly cage containing a small wire mouse cage in which were 6 uninfected mice (Figure 2). The mice were watered and fed daily, and the flies received fresh uncontaminated milk and water soaked up in absorbent cotton in an open Petri dish. In addition, each day the small half of a Petri dish with the open side down and several pieces of fruit peel were placed on the floor of the cage. At the end of the 4th, 12th, and 18th days all dead flies and from 5 to 14 live flies were removed for examination. The food and water of both the mice and flies, the fruit peel, the exposed Petri dish, the mouse pellets which had fallen out of the mouse cage onto the floor of the fly cage, and

those pellets in the pan of the mouse cage were also examined. To avoid direct contamination by flies of exposed pellets on the floors of the cages, one or more pellets were forced from the intestinal tract of each of the 6 mice on each day examinations were made.

At the conclusion of this experiment, to determine whether transfer of *Salmonella enteritidis* from infected mice to flies was possible, the mouse cage and the feeding and watering cups were first sterilized by autoclaving. The fly cage was thoroughly washed with 5 per cent phenol, allowed to air dry, and a fresh uninfected population of flies placed in it. The sterilized mouse cage containing the 6 mice of the previous experiment, 4 of which were demonstrated to be infected with *Salmonella enteritidis*, was placed in the fly cage. At 1 week intervals for 3 weeks the food and water of both mice and flies, the fruit peel, the exposed Petri dish, and mouse pellets were examined for *Salmonella enteritidis*.

In the first of these experiments, in

TABLE 3

*Transmission of Salmonella Enteritidis from Flies to Mice and from Mice to Flies*

Examination Made of:	Transmission of <i>Salmonella Enteritidis</i>					
	From Flies to Mice <sup>1</sup>			From Mice to Flies <sup>2</sup>		
	Day Examined					
	4th	12th	18th	7th	14th	21st
Fruit peel	+	+	+	+	+	
Fly food	+	+	+	+	+	0
Fly water	0	+	+	0	+	+
Petri dish	+	+	+	+	+	0
Surface washing of flies <sup>3</sup>	0	0	0	0	0	0
Intestinal tract of flies <sup>4</sup>	+	0	+	+	+	+
Mouse water			+		+	+
Naturally expelled mouse feces	+	+	+	0	+	+
Forced pellets from 6 mice	4+	4+	4+	5+	4+	2+
Mouse food	+	+	0	0	+	0

<sup>2</sup> Dead { 1—41st day, kidney and liver +  
1—59th day, negative autopsy

<sup>2</sup> Dead { 1—41st day, kidney and liver +  
1—59th day, negative autopsy

1. Three hundred infected flies placed in a sterile cage with 6 normal mice and examinations made as indicated.

2. The infected mice placed in a sterile cage with 300 uninfected flies.

3. Washings of chemically treated flies.

4. Ground up flies after chemical treatment to remove surface organisms.

+ *Salmonella enteritidis* isolated.

0 *Salmonella* not isolated

which infected flies were caged with uninfected mice, as will be noted in Table 3, the test organism was isolated from the fruit peel, fly food, naturally expelled mouse pellets, and Petri dish on the 4th, 12th, and 18th days, while the fly water, mouse food and macerated flies after chemical treatment contained *Salmonella enteritidis* on 2 of the 3 test periods. The mouse water was examined only once and found to contain the test organism. Mouse pellets forcibly expelled were found to contain *Salmonella enteritidis* on each of the test periods from 4 of the 6 mice used.

In the second portion of these experiments, in which infected mice were caged with uninfected flies, examinations were made of the fruit peel, fly food and water, Petri dish, mouse food and water, and mouse pellets at 1 week intervals for 3 weeks. The test or-

ganism was isolated at least once from each of these materials. Macerated flies, after chemical treatment, contained *Salmonella enteritidis* at the end of the 1st week and continued to harbor the test organism for the duration of the experiment. At the end of the 1st week 5 of the 6 mice were shedding the test organism in the feces, as shown by examination of pellets forcibly expelled, whereas only 4 mice were positive for *Salmonella enteritidis* at the end of the 2nd week, and only 2 were positive at the end of the 3rd week. One of the 2 mice, shedding the test organism at the end of the 3rd week in the second half of these experiments, died on the 41st day. *Salmonella enteritidis* was isolated from the liver and kidney. Another mouse, shedding the test organism at the end of the 2nd week but not at the end of the 3rd week, died after the conclusion of this.

experiment (59th day). No positive cultural tests for *Salmonella enteritidis* were obtained on autopsy.

SURVIVAL OF *SALMONELLA ENTERITIDIS*  
DURING METAMORPHOSIS OF  
HOUSE FLY

To determine the ability of *Salmonella enteritidis* to survive during metamorphosis of the house fly, the following experiments were conducted. Fly eggs were collected on milk- and water-soaked cotton. The eggs were removed with the aid of a penknife and suspended in physiological salt solution in order to break up the small clumps. Settled eggs were resuspended in fresh physiological salt solution and again allowed to settle. In this manner, using only settled eggs, the eggs were washed 5 times. After the final washing the eggs were resuspended in physiological salt solution and poured on the surface of the bran-alfalfa-leaf-meal medium which had previously been sterilized by autoclaving. Immediately following this, 10 ml. of an 18 hour broth culture of *Salmonella enteritidis* was poured over the surface of the mash. The battery jar of infected mash and eggs, covered with sterile cotton-covered cheesecloth, was allowed to stand until full-grown maggots had developed. Approximately 500 maggots were removed, washed with physiological salt solution several times, and then treated with sodium hydroxide, aerazol and formaldehyde, as described previously, followed by direct washing in tetrathionate broth. Approximately one-half the treated maggots were then ground in a sterile mortar and examined for the test organism, as were the washings before chemical treatment and specimens of the infected mash. The balance of the treated maggots were placed on sterile sawdust in a Petri dish to pupate, and emerging flies were trapped and examined for *Salmonella enteritidis*.

The test organism was recovered from the infected mash and from the washings of the maggots before chemical treatment. Although chemical treatment failed to sterilize the surface of the maggots, all Gram-negative forms were destroyed and *Salmonella enteritidis* was not recovered from washings of maggots following this type of treatment. The test organism was recovered, however, from the residue of ground maggots after such chemical treatment, and *Salmonella enteritidis* was isolated from the residue of ground flies, trapped as they emerged from the pupal case. The remarkable resistance of maggots to rigorous chemical treatment, wherein they were exposed to a mixture of 1 per cent sodium hydroxide, 1 per cent aerazol, and 5 per cent formaldehyde for 30 minutes, is exemplified by their ability to emerge from the pupal stage following such treatment.

DISCUSSION

The known habits of flies make them important vectors in and around food establishments of bacteria of all kinds with which these pests may come in contact. In our preliminary studies of this problem we were able to demonstrate that flies are an extremely potent source of pollution organisms, particularly in those food plants where little attention is paid to sanitation and where the food is prepared for the consumer without a final treatment to destroy these organisms.

In extending our studies to include an organism of the food poisoning type, it has been demonstrated that *Salmonella enteritidis* may be transmitted with ease and rapidity through several populations of flies, and that all surfaces with which the infected fly comes in contact become potential sources of reinfection for other insects. Our studies show that not only does the fly carry the organism on its outside

surfaces, but also in its digestive tract, since the infected, macerated insect contains large numbers of the test organism while the organism cannot be isolated from the chemically treated, washed fly. The ease of transfer of food poisoning organisms from fly to fly and the fact that such organisms survive in the fly for practically the entire life span of these insects lends added significance to their potentialities as sources of food poisoning outbreaks. In contrast to the significance of rats and mice as vectors of food poisoning organisms, house flies appear to us to be much more important in food plant sanitation.

The transfer of food poisoning bacteria by flies to mice and the subsequent retransfer from infected mice to flies, with apparent ease of transmission of infection, mark these insects as potential health hazards wherever food that is to be eaten raw is being prepared. Whereas it was found<sup>5,6</sup> that the strain of *Salmonella enteritidis* used in these experiments produced a high incidence of fatalities in mice in 13 days or less, only 2 of the 6 mice infected through flies died, 1 on the 41st day and the other on the 59th day after infection. Although the strain used has been shown to be highly fatal for both rats and mice when fed by stomach tube, in the present studies the rodents survived for considerably longer periods of time. It is not possible to say whether this may be associated with a loss of virulence of this organism or from other factors. However, it is worthy of mention that in some dissociation studies not yet completed both coliform bacteria and *Salmonella enteritidis* produced a number of variants on passage through flies, and this may have some bearing on the ability of those mice infected through flies to survive infection.

The data obtained on the survival of *Salmonella enteritidis* during meta-

morphosis of the house fly indicate that flies breeding in infected material can give rise to infected maggots, pupae, and adults. Although the potential danger of infection of fly breeding grounds may be remote, the possibility of its occurrence would constitute a source of grave danger, particularly during the summer months when fly breeding is at its peak and climatic conditions are most favorable for bacterial development. The removal of waste and refuse from the vicinity of food producing plants, adequate protection by screening to prevent fly contact with food, and the elimination of flies from such establishments are essential in plant sanitation.

#### SUMMARY—CONCLUSIONS

Flies fed on food infected with *Salmonella enteritidis* are capable of infecting other flies as well as the food, water, and miscellaneous surfaces with which they come into contact.

*Salmonella enteritidis* apparently survives in the fly for the duration of the life of the fly, approximately 4 weeks.

Transfer of *Salmonella enteritidis* infection from infected flies to mice and the retransfer of infection from infected mice to flies was successfully carried out.

Fly eggs planted in mash infected with *Salmonella enteritidis* resulted in infected maggots, pupae, and adults.

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# Training of Medical Personnel in Syphilis Control\*

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DURING the latter half of 1937 a 4 weeks' postgraduate course in syphilis control was organized in the Vanderbilt University School of Medicine. The syphilis clinic was organized as a special clinic in the Department of Medicine during 1926, and was for a number of years concerned only with the instruction of undergraduate students. The expansion of the clinic activities for postgraduate instruction was made possible by funds allotted by the U. S. Public Health Service. The first course was given in January, 1938, and was repeated 6 times each year prior to July 1, 1941.

The need for postgraduate training was the outcome of rapid expansion of the syphilis control program and lack of prepared personnel to direct the various activities which were being organized in the respective states. The increase in number of syphilis clinics in the United States during the past ten years is shown in Table 1. In 1935 there were 656 clinics reporting from the various states. By 1940 the number was over three times as great. This rapid expansion was made possible by funds made available to the individual states from appropriations for venereal disease con-

trol after passage of the Social Security Act in 1935 and the Venereal Disease Control Act in 1938.

The course in syphilis control was planned especially for the training of county health officers, private physicians coöperating with local health departments and public health nurses. The chief objectives were to provide an opportunity for a period of intensive instruction in diagnostic and therapeutic procedures, epidemiology, and the broader public health aspects of syphilis control. The advisability of having a 4 week period of instruction was questioned when the course was first organized. It seemed advisable, therefore, to evaluate the 3½ years' experience with the short intensive course of instruction.

## CLINICAL ORGANIZATION AND OUTLINE OF COURSE

A detailed description of the organization of the course was published by Kampmeier and Clark in 1939. The syphilis clinic is attended each week by about 350 patients, both white and colored, in four clinic sessions, one of which is a night clinic. The organization of the clinic is shown in Diagram 1.

The clinic staff is made up of 3 full-time members of the Department of Medicine, a visiting dermatologist, 2 full-time members of the Department of Preventive Medicine and Public Health, and 2 social workers especially trained

\* From the Department of Preventive Medicine and Public Health and the Department of Medicine aided by funds allotted by the United States Public Health Service.

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TABLE 1

*Report of Coöperative Clinic Activities Furnished through State Health Departments  
from 1930-1940\**

<i>Year</i>	<i>Number of Clinics Reporting</i>	<i>New Cases Admitted</i>	<i>Increase in Number of Clinics Reporting</i>
1930	477	127,978	...
1931	512	143,982	35
1932	533	150,906	21
1933	572	154,302	39
1934	616	129,293	44
1935	656	134,720	40
1936	713	126,271	57
1937	965	149,472	252
1938	1,122	197,303	157
1939	2,085	314,594	963
1940	2,454	355,589	369

\* Data taken from Table IV, page 148, modified to show increase in number of clinics per year, of 1940 Annual Report—Surgeon General of the Public Health Service of the United States.

in contact investigation and follow-up of patients under treatment.

#### SCHEDULE OF HOURS AND SUBJECT MATTER

The distribution of the 160 scheduled hours for the course, according to subject matter, is shown in Table 2.

The clinic sessions of which there are four take up a total of 44 hours. Each student spends the first 2 hours in the clinic with a member of the staff and individual cases already under treatment are seen. Problems in the man-

agement of each patient are discussed. The students also have an opportunity to discuss these patients with reference to epidemiology and follow-up based on field experience. Education of patients and methods of obtaining names of contacts are demonstrated. During the last hour of each clinic session new patients are presented to the entire student group. The history of each patient is reviewed, the diagnosis discussed, and darkfield technic demonstrated. In this way every new patient admitted to the clinic is seen by the

TABLE 2

*Schedule of Hours of Instruction in Syphilis Control Work for Postgraduate Students*

<i>Subject Matter</i>	<i>Hours</i>
Clinics .....	44
Individual instruction and special activity in which trainee is especially interested .....	28
Lectures .....	22
Library assignments—Reading .....	15
Epidemiology—Seminars .....	12
Reports and discussion of assigned readings—Seminars .....	12
Assigned contact investigation without assistance .....	10
Field investigation with epidemiologist and social workers	
1. Contact investigation .....	9
2. Follow-up .....	4
Pediatrics—Congenital syphilis .....	4
Record keeping and clinic operation .....	
Total Hours .....	160

## POSTGRADUATE INSTRUCTION IN SYPHILIS CLINIC

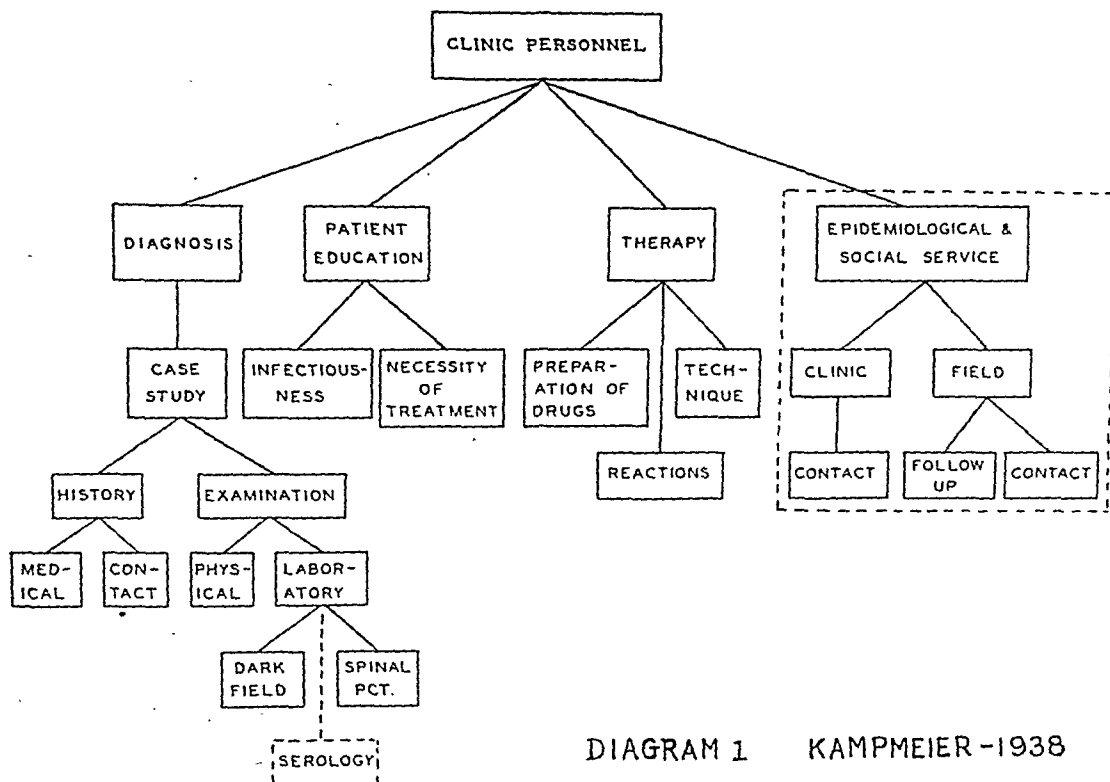


DIAGRAM 1 KAMPMEIER-1938

entire group and all phases of management of these patients are observed.

About one-third of the time is assigned to group instruction in the form of lectures and seminars. Lectures are given on the clinical and epidemiologic aspects of syphilis. These are supplemented by assigned readings in the library. These readings are discussed in seminars conducted by a member of the full-time staff. During the first 2 weeks the procedures used in obtaining names of contacts and methods employed in the field are discussed. During this 2 week period each student is required to make field trips with the epidemiologist and social worker to visit contacts and learn methods of approach in getting contacts to come in for examination. During the last 2 weeks each student is assigned two or more contacts of acute or early cases

of syphilis which he must visit and get in for examination without assistance.

Congenital syphilis is discussed by a member of the full-time pediatric staff in the syphilis clinic conducted in the outpatient pediatric service.

The students are also given opportunity to spend some time on various phases of epidemiology or clinical syphilis in which they may be especially interested. In some instances trainees have conducted special clinical studies, as well as participating in the clinic, for a period of 3 or more months.

Postgraduate nurses attend the lectures and seminars, and are given the same course of instruction except that they spend their time in the clinic with the social workers. They attend patient demonstrations at the close of each clinic session, when new cases are presented and discussed. At the close of the 4 weeks' session they are assigned to the

social workers for another 4 weeks' period of field training. Social problems are taken up and they are assigned cases in the clinic for follow-up. Also additional contacts are assigned to be visited and brought to the clinic or directed to private physicians or to other clinics for examination.

#### DISTRIBUTION AND TYPE OF MEDICAL PERSONNEL

Six physicians and 2 nurses are admitted to each 4 weeks' course. Since the postgraduate instruction was organized (3½ years ago) 115 physicians and 33 public health nurses have completed the course. In the group of 115 postgraduate physicians, 54 were health officers and 61 were practising physicians who were coöperating with their local health departments in the syphilis control program. The nurses were previously engaged in some type of public health work, either in a county or city, or as supervisors in the state or county public health nursing program.

A geographic distribution of trainees is shown in Table 3.

The physicians and nurses have come from 11 states for postgraduate instruction in syphilis control. Kansas has furnished 2 nurses; California, Okla-

homa, and Virginia have each sent only physicians. Mississippi has furnished 68 of the 115 physicians and 10 of the 33 nurses. It is also interesting to note that 53 of the 68 physicians from Mississippi were private practitioners participating with their local health departments in the syphilis control program. Only 3 other states have sent private physicians: Oklahoma 4, Missouri 3, and Texas 1. There have also been more health officers from Mississippi than any other state, 15 in all. California has had 9 and Missouri 8 health officers who have completed the course. Mississippi, Oklahoma, Missouri, and Texas have had both health officers and private physicians. The remainder of the states sending physicians have sent only full-time health officers.

Five states, Mississippi, Missouri, Texas, Tennessee, and Alabama have sent 27 of the 33 nurses who have completed the full 8 week course of training.

#### INFORMATION OBTAINED BY QUESTIONNAIRE

In order to get some evaluation of the short but intensive period of training, questionnaires were mailed to all

TABLE 3

*Geographic Distribution of Postgraduate Physicians and Nurses Over 3½ Year Period*

State	Health Officer	Private Physicians	Total Physicians	Nurses	Total Postgraduates
Mississippi	15	53	68	10	78
Texas	8	1	9	4	13
Missouri	4	3	7	5	12
Tennessee	6	..	6	4	10
California	9	..	9	..	9
Oklahoma	5	4	9	..	9
Alabama	2	..	2	4	6
Louisiana	3	..	3	2	5
A-kansas	1	..	1	2	3
Kansas	..	..	..	2	2
Virginia	1	..	1	..	1
Total	54	61	115	33	148

TABLE 4

*Type of Teaching Material and Methods Preferred by Physicians Answering Questionnaire*

Rating	Lectures	Observations with Staff in Clinic	Case Demon- strations	Epidemiology Contact Tracing	Reading Assignments and Reports thereon
1	41	14	11	1	1
2	10	16	31	4	0
3	12	16	16	8	12
4	1	8	3	17	22
5	..	4	3	24	21
Not Answered	6	12	6	16	14
Total	70	70	70	70	70

postgraduate physicians and nurses. Forty health officers, 30 private physicians coöperating with health departments, and 22 nurses answered the questionnaire. Table 4 shows the type of teaching material and methods preferred by the 70 physicians. Material presented in the lectures was rated first by the highest percentage of physicians. Working with the staff in the clinic and

case demonstrations at the end of each clinic period were also given a high rating. It is interesting to note that epidemiology was rated first by only 1 and second by 4 of the physicians. In many instances the statement was made in the questionnaire that they realized that epidemiology was the most important part of the syphilis control program, yet they personally did not

TABLE 5

*Information Obtained from 70 Physicians Concerning Procedures Used in the Management of Patients with Syphilis**1. Method of Treatment*

	Health Officers (40)	Private Physicians (30)
No Change	24	6
Slight Change	10	5
Radical Change	4	15
Not Answered	2	4

*2. Spinal Fluid Examinations*

Doing Spinal Punctures	29	12
Having Spinal Punctures Done	5	15
Rarely Do Spinal Punctures	1	..
Not Doing Spinal Punctures	5	3

*3. Darkfield Examinations*

Darkfields Done	31	5
Darkfields Done by Others	5	19
Darkfields Not Done	4	5
Not Answered	..	1

*4. Getting Names of Contacts*

Gets Names Personally	35	23
Nurse Gets Names	4	6
Not Getting Names	1	1

like to do contact investigation or follow-up work.

Table 5 gives some general points with reference to management of patients with syphilis. It is noted that 50 per cent of the private physicians stated that they had made radical changes in their method of treatment. A high percentage of both health officers and private physicians were either doing or having darkfield examinations done and spinal fluids examined. It is also encouraging to find that only 1 health officer and 1 private physician were not getting names of contacts of acute cases. The health officer stated that this was not being done because of lack of clinic personnel.

#### CLINIC ACTIVITIES OF HEALTH OFFICERS AND PRIVATE PHYSICIANS

Table 6 shows the number of clinics the 39 health officers conducted or had under their direct supervision each week. These figures show an average of 5 clinics per week. In the 196 syphilis clinics conducted by health officers the average number of patients treated per week was 20,000. Two of the health officers stated that they were operating clinics in which 2,000 patients were treated per week. Information as to the number of physicians participating in the 196 clinics per week was not obtained.

Table 7 shows that the private physicians participating in the clinics under health department supervision assist in one or two clinics and spend an average of from 3 to 4 hours each week in the

clinics. Each of these private physicians treats an average of approximately 100 patients per week.

It was also significant that practising physicians answering the questionnaire stated that they were assisting in every way possible to stimulate interest in venereal disease control in their particular locality and among the members of the medical profession. Many stated that they were getting names of contacts from private patients and that these names were turned over to the health department for investigation.

TABLE 7

#### *Activities of Private Physicians Participating in Treatment Clinics under Health Department Supervision*

Total Number of Private Physicians	26
Average Number of Clinics Per Week	1-2
Approximate Number of Hours Spent in Clinics Per Week	3-4
Average Number of Patients Treated Per Week	2,550

#### ACTIVITIES OF THE PUBLIC HEALTH NURSES

Twenty-two of the 33 nurses who had completed the course answered the questionnaire. Seven of the 22 were spending full time on venereal disease control although 1 had recently been transferred to routine public health duty in her county. Two of these full-time nurses were located in large cities. Of the remaining 15, 7 were routine public health nurses having charge of one or more districts in a county; these were also assisting in the clinics in contact investigation and follow-up of patients under treatment. Six of the nurses stated that they were acting as supervisors for large districts in the state nursing program. One nurse had married and another died a few months after completing the course of instruction. In all, 20 were actively engaged in some phase of the venereal disease control program.

TABLE 6

#### *Syphilis Clinics Conducted by Health Officers*

Number of Health Officers	39*
Total Number of Clinics Per Week	196
Average Number of Patients Treated Per Week	20,000

\* One Health Officer who had been called into the Army failed to answer this part of questionnaire.

## INFORMATION OBTAINED BY FIELD VISITS

The field visits were made by two members of the teaching staff. This was done to obtain firsthand information relative to the value of the 4 weeks' course, with special reference to clinic management and application of epidemiological methods in the different clinics. An effort was also made to see how the private physicians were functioning in coöperation with local health units in the syphilis control program. Sixteen physicians and 5 nurses were visited in 3 states, Missouri, Arkansas, and Mississippi.

The physicians taking courses in syphilis control have returned usually to small communities, though a number entered upon full-time venereal disease control work in larger centers of population. The latter usually devoted 3 or more months to training in our clinic.

One of the most valuable achievements noted was the better coöperation of the private physicians with official health agencies as a result of their broader concept of the syphilis problem. Many of the county health officers pointed out that practitioners who had formerly been disinterested or who had actually opposed the work had acquired a changed viewpoint and were giving wholehearted support to the syphilis control program. This change in attitude was also observed by the public health nurses who were interviewed. As an example, may be mentioned the private physician who, out of his own funds, had constructed a building to house a syphilis clinic in his community. Another private practitioner organized a campaign to obtain an appropriation from the city council of a small country town for a community health center. He was successful in his effort and was very proud of this accomplishment. It was learned from the health officer that this physician had not been particularly interested

in public health before taking the postgraduate course.

Observations made in the clinics conducted by health officers confirmed the information obtained from the questionnaires with regard to the use of more modern diagnostic and epidemiological procedures.

Upon the public health nurse falls most of the burden of contact investigation. These field visits indicated that the nurse who had completed the course was able to carry on this work more efficiently and was also instrumental in stimulating the physicians to get names of contacts of acute cases. These public health nurses were also training other nurses in the local health units in the principles of syphilis control.

## SUMMARY AND CONCLUSIONS

The manner in which the short intensive course of instruction in syphilis control has influenced the postgraduate physicians and nurses has been reviewed. The course has been given to 115 physicians and 33 public health nurses from 11 states. The private physicians and the health officers have adopted more modern methods for diagnosis and treatment. Procedures such as darkfield and spinal fluid examinations are being used by physicians who, before taking the course, had not made use of these diagnostic aids.

The attitude of the private physicians toward the syphilis control program has been markedly improved and there has been better coöperation with health agencies in all phases of the syphilis control program.

The administration of syphilis control measures by the local health officers has improved as a result of better understanding of the syphilis problem. Contact investigation, which had been neglected, is now a routine public health procedure. Public health nurses who have taken the course have been particularly helpful in this phase of the

work and have trained other nurses in the local health departments.

In general, our 3½ years' experience in training personnel in syphilis control has led us to believe that much can be accomplished with the short intensive course of instruction.

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2. Kampmeier, R. H., and Clark, E. Gurney. A Four-week Postgraduate Course in Syphilis Control. *Ven. Dis. Inform.*, 20:153-156, 1939.
3. *Annual Report—Surgeon General of the United States Public Health Service*, 1940, p. 148.

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U. S. Quinine Supply

THE Reconstruction Finance Corporation recently announced that 500,000 ounces of the 2 million ounces of quinine that it had purchased on the recommendation of the War Production Board had been lost at sea. The Netherlands Indies which has supplied the world with 90 per cent of its cinchona bark and derivatives now being cut off, it becomes a problem to know how the annual consumption of the United States of 3½ million ounces of quinine can be supplied. It was expected that the trade and private consumers had between one and two years' supply on the shelf.

The Federal Loan Administration announced that the Defense Supplies Corporation had purchased 1½ million ounces and had agreed to purchase cinchona bark equivalent to more than 3

million ounces, arranging for its immediate shipment to Australia for transshipment to the United States. This is expected to supplement the supplies obtainable from Peru, Bolivia, Brazil, Venezuela, Colombia, and Guatemala. The United States Government and private American drug interests have fostered experimental work recently in South America looking toward the production of types of cinchona yielding higher amounts of quinine.

Announcement was also made that substantial progress had been achieved in the manufacture of true synthetic quinine through the U. S. Public Health Service. Unlimited quantities of atabrine can be produced in the United States and it was expected that there was little likelihood of shortages in quinine itself for its essential purposes.

# Human Equine Encephalomyelitis and St. Louis Encephalitis in California, 1939-1941\*

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IN previous reports<sup>1, 2</sup> it had been demonstrated by means of the serum neutralization tests and by recovery of the active agent itself, that the virus of western equine encephalomyelitis has been responsible for human cases of the disease in California for some time past. Antibodies against the St. Louis encephalitis have likewise been found among the population in similar geographical areas of the two central valleys of the state. Because the equine type of encephalitis has now become recognized as a clinical entity in man, the earlier study has been continued and a summary of the findings from 1939 through October, 1941, is herewith presented. Subsequent to the earlier articles, Davis,<sup>3</sup> Cope and Maytum,<sup>4</sup> and van Wageningen<sup>5</sup> have published on the clinical aspects of the disease, and Buss and Howitt<sup>6</sup> have presented a detailed study of human equine encephalomyelitis as seen in Kern County, Calif. Because the test for neutralizing antibodies has proved an aid in the differentiation of neurotropic virus diseases, the physicians are now better able to evaluate the etiology of their cases, separating those with mild encephalitis from those having non-

paralytic poliomyelitis, where formerly many were reported as the latter disease.

## NEUTRALIZATION TESTS

The serum neutralization test as used in this study was employed essentially in the same manner as previously described,<sup>2</sup> except that rabbit serum was added to the broth diluent rather than distilled water. Two dilutions of each virus were made from a 10 per cent mouse brain suspension in Ringer's solution. The weaker dilution was about 10 times, and the stronger 50 times the least amount of virus that killed 50 per cent of the mice upon titration. The serum and virus dilutions were added in equal parts, left overnight in the refrigerator, and inoculated intracerebrally into young white mice. A serum was considered positive if it neutralized both dilutions of virus, and weakly positive if it only protected against the higher dilution. Because of the many tests performed with the same technic over a long period of time, and because they were repeated on the weakly positive sera, no differentiation has been made in computing the final results. All tests showing some degree of protection have been included as positive in the tables.

Protection tests were run routinely against the St. Louis virus of encephal-

\* Aided by a grant from The National Foundation for Infantile Paralysis Incorporated.



litis (originally obtained through the courtesy of Dr. W. T. Webster of the Rockefeller Institute) and the virus of western equine encephalomyelitis, Br. strain of human origin.<sup>1</sup>

Table 1 gives the comparative results of the test for the years 1939, 1940, and 1941. Sera were received not only from the two central valleys of the state but a large number from the Bay Region and adjacent coastal towns. They were all from individuals having disturbances of the central nervous system, including poliomyelitis. The sera containing antibodies for the encephalitic viruses were from residents of either the Sacramento or the San Joaquin Valley, only one being positive for the St. Louis strain in the Bay Region. However, in 1941, two sera from the coastal counties of Santa Cruz and San Mateo, south of San Francisco, were found to neutralize the St. Louis virus. Both were from adults showing neurotropic disturbances and

were without contact with the inland valleys. Another serum positive for this virus was also obtained from Sonoma County north of the Bay Region. The only other protective sera have been from 6 children referred to San Francisco hospitals from the valley districts. They were all positive to the western equine strain.

The percentage of positive tests for the equine virus has fluctuated each year for the different regions as shown in Chart 1. There was an increase for Kern County during 1939 and 1940, dropping in 1941, while in Fresno County there has been a steady increase for each year. It may be of significance that more sera were positive only to the St. Louis strain from Tulare County than from the other endemic areas. The other valley counties reported many cases of encephalitis for 1940 but very few for 1941. In fact, the total number for these regions fell markedly during

TABLE 1

*Results of Serum Neutralization Tests on Cases Showing Neurotropic Symptoms\**

County	Positive or Negative to Virus	Number Tested	1939	Number Tested	1940	Number Tested	1941
Kern	W. equine	111	47 (42.3%)†	60	42 (70.0%)†	50	13 (30.0%)†
	W. equine alone		35 (31.5%)†	39	26 (66.6%)†		9 (18.0%)†
	St. Louis alone		5 (4.5%)†	39	0		8 (16.0%)†
	Equine and St. Louis		12 (10.8%)†	39	10 (25.6%)†		6 (12.0%)†
	Neg. to equine and St. Louis		59 (53.6%)0	60	18 (30.0%)0		27 (54.0%)0
Fresno	W. equine	42	9 (21.4%)†	25	14 (56.0%)†	36	23 (63.8%)†
	W. equine alone		8 (19.0%)†		11 (44.0%)†		12 (33.3%)†
	St. Louis alone		5 (12.1%)†		3 (12.0%)†		5 (13.8%)†
	Equine and St. Louis		1 (23.8%)†		3 (12.0%)†		11 (30.5%)†
	Neg. to equine and St. Louis		28 (66.6%)0		8 (32.0%)0		8 (22.0%)0
Tulare	W. equine	15	6 (40.0%)†	12	3 (25.0%)†	15	2 (13.3%)†
	W. equine alone		4 (26.6%)†		1 (8.3%)†		1 (6.6%)†
	St. Louis alone		2 (13.3%)†		5 (41.6%)†		8 (53.3%)†
	Equine and St. Louis		2 (13.3%)†		2 (16.5%)†		1 (6.6%)†
	Neg. to equine and St. Louis		7 (46.6%)0		4 (33.3%)0		5 (38.3%)0
Other Valley Counties	W. equine	40	13 (32.5%)†	64	31 (48.4%)†	29	8 (27.8%)†
	W. equine alone		11 (27.5%)†		23 (35.9%)†		3 (10.3%)†
	St. Louis alone		3 (7.5%)†		7 (18.9%)†		4 (13.7%)†
	Equine and St. Louis		2 (5.0%)†		8 (12.5%)†		4 (13.7%)†
	Neg. to equine and St. Louis		24 (60.0%)0		26 (40.6%)0		16 (55.1%)0
Bay Region	W. equine	54	0	50	0	40	0
	W. equine alone		0		0		0
	St. Louis alone		0		1 (2%)‡		0
	Equine and St. Louis		0		0		0
	Neg. to equine and St. Louis		54 (100%)0		49 (98.0%)0		40 (100%)0

† Sera neutralized the virus

0 Sera did not neutralize the virus

‡ Weakly positive

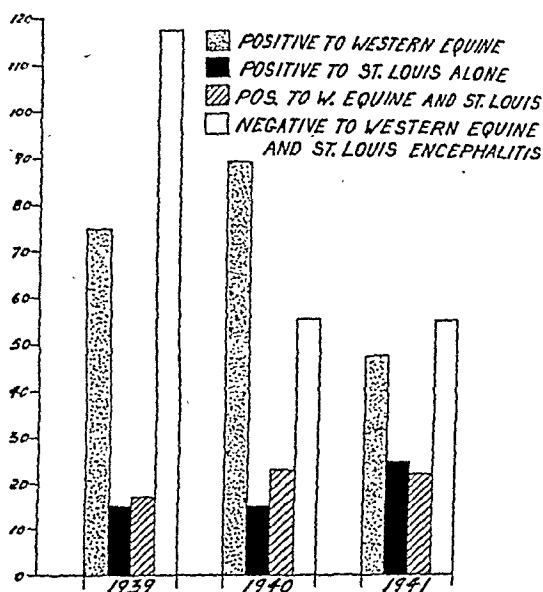


CHART 1—Comparative Incidence of Western Equine and St. Louis Encephalitis in the Central Valleys of California for 1939, 1940, and 1941 as Determined by the Serum Neutralization Tests

this year. While the figures given in the table are based on the number of sera received or on autopsy material, yet undoubtedly they do not represent all of the cases, because the blood was taken mainly from patients coming to the county hospitals, and many were probably missed.

During 1939, the number of tests that were negative to the encephalitic viruses increased for Fresno County with a corresponding decrease in those positive to the equine or the St. Louis strains. Because many cases were diagnosed as poliomyelitis and the latter virus was isolated three times from

fatal cases in Fresno in 1939, it seems probable that the negative sera were mainly from poliomyelitic patients. Kern County likewise reported as many as 73 (63.7 per cent) cases of poliomyelitis during the same year.<sup>6</sup> In 1940, encephalitis again increased in the same areas while poliomyelitis declined.

In 1941, all types of neurotropic virus diseases had decreased. The reduction was especially noticeable for the more northerly counties in the Sacramento Valley. Only 11 sera were received, by contrast with 33 in 1940. Twenty-one (63.6 per cent) of the latter had been positive for the western equine virus, while only 5 (15.1 per cent) reacted with the St. Louis strain. Three were positive for both viruses. The decrease in encephalitis for 1941 may be interpreted as due to a change in climatic conditions, because the rains were heavy and unusually prolonged during the early months of the year and thus unfavorable for the early appearance of an insect vector.

In Table 2 are given the complete data of the neutralization tests on sera from the two central valleys for 1939, 1940, and 1941, supplemented by the records for 1937 and 1938. The total numbers represent all the cases diagnosed as some form of neurotropic virus disease, including those of poliomyelitis. Except for 1940 the percentages have remained about the same for the sera positive against the western equine virus.

TABLE 2

Total Neutralization Tests on Valley Sera against Western Equine and St. Louis Viruses

	Number Tested 1937-38		Number Tested 1939		Number Tested 1940		Number Tested 1941	
Total W. equine	86	32 (37.0%)†	208	75 (36.0%)†	161	90 (55.9%)†	130	48 (36.9%)†
W. equine alone				58 (27.8%)†		57 (35.4%)†		25 (19.2%)†
St. Louis alone				15 (7.2%)†		15 (10.7%)†		25 (19.2%)†
St. Louis and equine	69	18 (26%)†		17 (8.1%)†		23 (16.4%)†		22 (16.9%)†
Total St. Louis	103	49 (47.5%)†		32 (15.3%)†		38 (27.1%)†		46 (35.3%)†
Negative to W. equine and St. Louis				118 (56.7%)0		56 (40.0%)0		56 (43.0%)0

† Sera neutralized the virus

0 Sera did not neutralize the virus

RECOVERY OF THE VIRUS AND  
MORTALITY RATES

While the differentiation of neurotropic virus diseases in California has been based largely on the results of the neutralization tests, yet findings on human autopsy material have also been available. Recovery of the viruses of both poliomyelitis and of western equine encephalomyelitis has given evidence of their presence in these localities. Previous reports have described the isolation of the latter strain from 2 human cases in 1939<sup>2</sup> and later from 2 others in 1940.<sup>6</sup> Another human strain has been recovered in 1941 from a 9 year old boy in the Fresno General Hospital.

During 1939 the virus of poliomyelitis was obtained from 3 out of 5 fatal cases diagnosed as bulbar poliomyelitis in Fresno County and again from one in 1940. It was also isolated from the feces of 6 individuals in Kern County in 1941. It is evident therefore that this virus is endemic in these areas and that the neurotropic diseases, poliomyelitis, western equine and St. Louis encephalitis, may at times be confused, particularly the abortive or non-paralytic forms or even certain types of paralysis.

In 1937 when epidemic encephalitis first became a problem in California, there were 40 deaths out of 102 cases reported to the State Department of Public Health or a mortality of 39.1 per cent.<sup>7</sup> Twenty-eight of these patients were in Fresno County with 13 deaths or 42.8 per cent fatality. In 1940 the deaths had fallen considerably in the lower part of the central valleys according to the report of Dr. H. L. Wynns of the State Department of Health.<sup>8</sup> The rate was 18.6 per cent of 43 cases in Fresno County and 15.2 per cent of 46 cases in Kern County. On the other hand, the fatalities in the more northerly districts varied from 20 to 25 per cent.

In 1941 the death rate was lower in the valleys. Two (4 per cent) out

of 50 neurotropic cases died in Kern County and 3 out of 35 (8.5 per cent) in Fresno County. The latter included one case of poliomyelitis. Unfortunately not all of the fatalities had confirmatory laboratory findings, so that while they were reported as encephalitis, the actual type frequently remained undetermined. However, one may not always recover a virus from post-mortem material, especially if it is sent from a distance. The western equine strain was isolated but 4 times from a total of 34 brains received since 1937. Four of the latter proved to be poliomyelitis, 3 were due to the tubercle organism, one to *Torula histolytica*, one to rabies, and one to *Staphylococcus aureus*. Two of the remaining cases were diagnosed as bulbar poliomyelitis but the others were probably due to encephalitis most likely of the equine type.

## AGE AND SEX DISTRIBUTION

Tables 3 and 4 show the age and sex distribution of the cases having antibodies against the equine and the St. Louis viruses for the years, 1939, 1940, and 1941. It is significant that more males than females are affected. This holds true for each year and for both types of viruses. Over twice as many males as females, or 176:82, showed antibodies for the 2 encephalitic strains.

When the data for the 3 years are combined and the ages are subdivided as in Table 4, the male cases still predominate for both viruses. The differences in sex are less noticeable among the younger children through the 12th year, when apparently the chances of exposure to an insect vector are more evenly distributed. On the other hand, owing to the more exposed outdoor life of the men in these agricultural regions, males over 13 years of age seemed to run a greater risk of becoming infected than females. This is also true for the

TABLE 3

*Age and Sex Incidence for Encephalitic Cases in Valley Areas*

Year	Positive to Virus	Total Number	Sex		Total Cases Tested	Age Incidence According to Positive Neutralization Tests			
			Male	Female		Under 1 Year	1-9 Years	10-19 Years	20 Years and Over
1939	W. equine	83	51	18	82	8	23	20	17
	St. Louis alone		(61.4%)	(21.6%)		(9.7%)	(28.0%)	(24.3%)	(20.7%)
	W. equine and St. Louis		(10.8%)	(6.0%)		(1.2%)	(2.4%)	(6.0%)	(6.0%)
			(19.2%)	(2.4%)		(1.2%)	(6.0%)	(4.8%)	(4.8%)
1940	W. equine	105	61	29	102	19	24	14	30
	St. Louis alone		(58.0%)	(27.6%)		(18.6%)	(23.5%)	(13.7%)	(29.4%)
	W. equine and St. Louis		(8.5%)	(5.7%)			(1.9%)	(5.8%)	(6.8%)
			(14.2%)	(7.6%)		(2.9%)	(4.9%)	(6.8%)	(7.8%)
1941	W. equine	70	28	19	69	7	10	12	14
	St. Louis alone		(40%)	(27.1%)		(10.1%)	(11.5%)	(17.3%)	(20.2%)
	W. equine and St. Louis		(28.5%)	(7.1%)			(10.2%)	(13.0%)	(11.5%)
			(20.0%)	(12.8%)		(1.4%)	(2.9%)	(13.0%)	(8.7%)

similar age periods in regard to exposure to the St. Louis virus.

All ages are affected by the western equine virus, varying from 16 days to 74 years, with the largest proportion in the group 0-10 years. There are also many cases among males 10 to 30 years old. In Kern County alone, for 1938, 1939, and 1940<sup>6</sup> the largest number of equine encephalomyelitic cases were under 10 years of age with many among infants under 1 year.

In California the ages most affected by St. Louis virus seem to lie between 13 and 30, with few cases among the

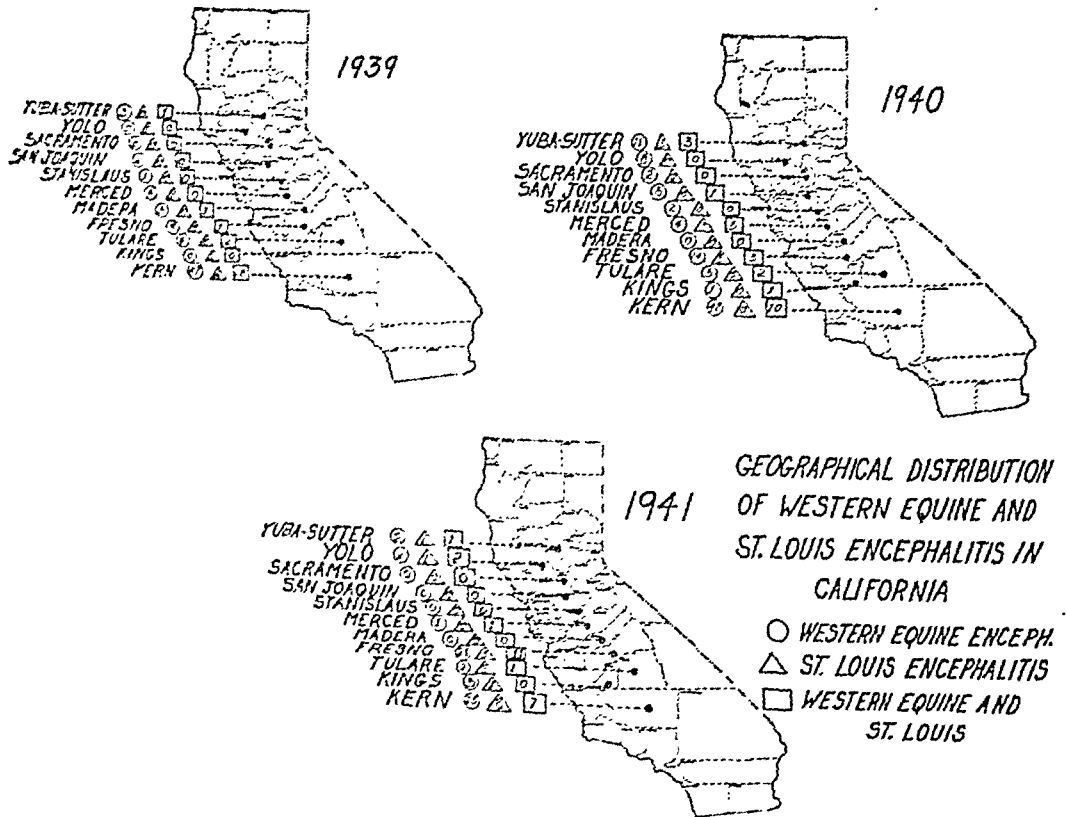
younger groups, the range in age extending from under 1 to 66 years. One 6 months old baby had antibodies only for the St. Louis strain. A month old child, 5 infants of 2 months, and another infant of 3 months were positive for both the St. Louis and the equine viruses. The serum of a 20 day old baby with encephalitis showed weak neutralizing ability when first tested for the St. Louis strain but was negative 2 weeks later. The mother had strong antibodies against this virus and it seems probable that the child had acquired them through placental trans-

TABLE 4

*Encephalitic Cases in the Central Valleys by Age and by Sex. Neutralization Tests Positive for the Virus for 1939, 1940, 1941*

Age Groups	Western Equine			St. Louis Alone			Western Equine and St. Louis		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
0-1	24	16	40	2	0	2	5	2	7
2-6	18	18	36	2	4	6	3	4	7
7-12	18	16	34	3	3	6	6	6	12
13-19	26	6	32	10	6	16	11	4	15
20-29	20	4	24	10	2	12	7	2	9
30-39	14	1	15	3	1	4	3	0	3
40-49	5	2	7	4	0	4	3	1	4
50-59	9	2	11	2	0	2	5	1	6
60-69	3	2	5	1	0	1	0	1	1
73-74	1	1	2	0	0	0	0	1	1
Total	138	68	206	37	16	53	43	22	65

MAP 1—Geographical Distribution of Western Equine and St. Louis Encephalitis in California for 1939, 1940, and 1941 as Determined by the Serum Neutralization Tests



fer. Antibodies for the equine virus predominated in the child's serum but were absent in that of the mother.

The individuals showing a combined antibody response were mainly from 7 to 39 years of age. More of these were positive among the younger groups than were those reacting to the St. Louis strain alone.

tends to concentrate in the center of the wide valleys over extensive areas. This portion is also the center of population and of agricultural industries. The distribution of the disease for the years 1939, 1940, and 1941 may be followed by reference to Map 1. It must be taken into consideration, however, if the large cities are designated, that the patients resided mainly in the outlying districts. The majority have originated from rural areas, small farms or homes of about an acre on which chickens and other domestic fowl, cows or other animals may be present. Though the affected place may be free of such animals, they are often found somewhere in the neighborhood. Everywhere in the endemic areas, mosquitoes are present some time during the spring or summer.

It is of interest that the individuals showing antibodies to the St. Louis virus often reside in the same regions

where the equine disease is prevalent both among man and horses. A glance at the map shows that the similarity of distribution is striking.

#### SEASONAL INCIDENCE

Each year there is a definite seasonal occurrence for both of the encephalitic diseases. The first human cases may appear about May or June in the southern counties of the San Joaquin Valley and later in those further north. They are prevalent during the hot summer months and often continue into the fall or even winter if the weather remains warm. This condition is especially noticed in Kern and Fresno Counties.

SEASONAL DISTRIBUTION OF  
WESTERN EQUINE AND ST. LOUIS  
ENCEPHALITIS IN CALIFORNIA

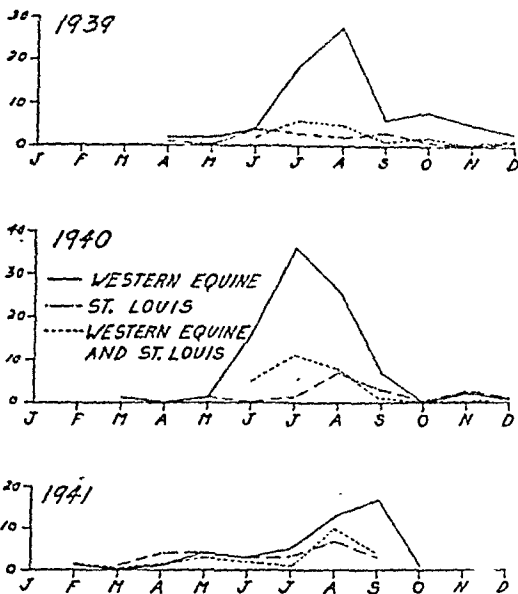


CHART 2—Seasonal Incidence of Western Equine and St. Louis Encephalitis in the Central Valleys of California for 1939, 1940, and 1941

The highest incidence of the equine type throughout the two central valleys, as estimated by the number of serum neutralization tests was in August for 1939, in July for 1940, and in September for 1941 (see data in Chart 2). The cases with antibodies only

for the St. Louis virus exhibited the same seasonal appearance with a slightly higher incidence in August. When antibodies were demonstrated for both types of viruses, the cases usually followed the distribution given for the equine form.

In order to correlate the seasonal appearance of encephalomyelitis in the human population with that among the horses, the official reports to the State Department of Agriculture have been used through the courtesy of Dr. C. U. Duckworth. It was noticed that if the data for the valley counties as a whole were compared, the frequency of the equine disease paralleled that of the human, but if they were considered by separate counties, the greatest incidence for the horses occurred approximately one month prior to that for man. This regional difference is in all probability conditioned by the late appearance of an insect vector in the more northerly sections of the state.

It should be emphasized that the cases in horses which come to the attention of the veterinarians, have been diagnosed almost entirely by the clinical symptoms unconfirmed by laboratory findings, while the majority of human encephalitides have been differentiated by the serum neutralization test. Nevertheless, in the counties with the highest incidence, sick horses and human cases of encephalitis are often in close, but not necessarily intimate association. Affected individuals may not possess a horse, yet sick animals might be within one-half to one mile distance.

Not only is the seasonal incidence coincidental for the two encephalitic diseases but poliomyelitis also occurs simultaneously in the same areas. In Kern, Tulare, and Fresno Counties the incidence of poliomyelitis may fluctuate each year but nevertheless sporadic cases are always to be found. Both these diseases are definitely endemic.

## PRESENCE OF NEUTRALIZING ANTIBODIES IN HORSE AND FOWL SERA

The simultaneous presence of neutralizing substances for both the St. Louis and the western equine viruses in many human sera and the demonstration of antibodies against the latter strain in the sera of domestic fowl<sup>9</sup> prompted the further examination of blood samples of animals from different regions. Since a preliminary report has already been made,<sup>10</sup> only a brief statement is deemed necessary. It was found that antibodies against the St. Louis and the western equine viruses could be demonstrated in a certain percentage of both horse sera and those of domestic fowl; chickens, turkeys, ducks, pigeons, pheasants, and peacocks, and that more positive results were obtained from endemic than from non-endemic areas. The sera of 32 chicks hatched in the laboratory were all negative. Comparatively few sera showed antibodies only for the St. Louis virus. However, the percentage was high, 77.7 per cent of 46 animals, when the sera yielded reactions for both types.

With the exception of a few horses, most of the animals tested were apparently normal. It has been demonstrated by Ten Broeck<sup>11</sup> and by Howitt<sup>9</sup> that domestic fowl may remain clinically unaffected by the equine virus and yet carry the latter in the peripheral circulation for a certain period of time. Further experiments have shown that young chicks may remain well after inoculation with the St. Louis strain and yet harbor virus in the blood through the 30th hour. The possibility of these inapparent infections in relatively insusceptible animals, especially fowl, strongly suggests the barnyard as a potential reservoir for the encephalitic viruses, particularly since both types have recently been recovered from the mosquito, *Culex tarsalis*, by Hammon,

Reeves, Brookman, Izumi, and Gjulin.<sup>12</sup> Hammon and associates have also<sup>13</sup> reported the results of testing the sera of a large group of birds and mammals in the Yakima Valley and found a higher percentage neutralizing the equine or the St. Louis viruses among domestic than wild animals.

## NEUTRALIZATION TESTS ON SERA OF NON-ENCEPHALITIC INDIVIDUALS

It has always been a question as to what interpretation to place on the results of the neutralization tests for the encephalitic cases. Does a positive test indicate contact with the disease and how many members of the population might be expected to have neutralizing antibodies? Buss and Howitt<sup>6</sup> have reported the tests against the western equine virus made on sera of normal individuals in the endemic areas of Kern County. Of 82 friends and relatives of acute cases, the sera of only 6 (7.3 per cent) were positive, while 97 (86.6 per cent) of 112 sera from acute encephalitic patients in the same areas reacted to the equine virus. Of 82 bloods from cases of poliomyelitis, only 5 (6.0 per cent) neutralized this strain. Thus a normal expectancy of 6.6 per cent positive neutralization tests for the equine virus is probably correct for a comparable group of non-encephalitic individuals in an endemic region. When one takes into account the findings on sera tested from a non-endemic district like the San Francisco Bay region together with the low figures for the normal group in an endemic area, the higher percentages for the acute cases acquire definite significance and the test would appear of value as a diagnostic aid for the equine disease.

The results, however, are not as conclusive in regard to the value of the neutralizing antibodies against the St. Louis virus, since many human beings in the general population may be

affected in an endemic region. In a series of 144 sera received from people in the Bay Area during the past 3 years, only one (0.6 per cent) has given a weakly positive reaction. In another group of sera from poliomyelitic cases in the coastal city of Tacoma, Wash., only 4 (6.4 per cent) were positive to the St. Louis virus as compared to 28 per cent or 7 times the number reported by Hammon<sup>14</sup> and by Hammon and Howitt<sup>15</sup> for a group among non-encephalitic people in the endemic Yakima Valley, Wash.

Blood from a comparable group of either poliomyelitic patients or normal contacts has been tested from the valley regions of California. Of 95 sera, 15 (15.7 per cent) were positive for the St. Louis virus or an expectancy of over twice as many for this disease among the normal population in the same areas as for the equine strain. The percentage of positive tests in this endemic region was about one-half that among the normal individuals as for those in the Yakima Valley, where a higher incidence is found for the St. Louis virus.<sup>14,15</sup> From the data collected it would seem that the presence of antibodies for the St. Louis strain may not be as etiologically significant in the diagnosis as their presence for the western equine virus in a similar area.

Notwithstanding, it appears that the St. Louis virus is the responsible agent for a number of the acute encephalitic cases in certain districts and that the presence of protective substances in the blood would be of diagnostic importance among the younger age groups. Positive tests for this strain alone were obtained on the sera of 2 encephalitic infants under 1 year and on those of 7 when in combination with antibodies for the equine virus. Six children under 6 years of age were also positive only to the St. Louis virus. The ages responsible for most of the positive

tests, however, remain in the older groups, mainly 12 to 30 years.

In most localities the western equine virus is apparently the more predominant agent of the 2 diseases as shown by the greater number of positive protection tests among the acute cases, although the St. Louis type has been more in evidence in Tulare County during 1940 and 1941. A total of 140 tests were positive for only the equine strain as compared to 55 for only the St. Louis during the past 3 years, or over 2½ times as many for the equine virus. Although the St. Louis strain itself has not so far been recovered in California, yet it seems likely that it is present, but not of as great a significance as the western equine virus.

#### NEUTRALIZATION TESTS ON SERA FROM OTHER CALIFORNIA DISTRICTS

While the major portion of the blood samples have come from the two central valleys of California, yet a small number have also been received from the southern part of the state. No positive tests were obtained against the equine virus until 1941 when the serum of one man from Orange County contained neutralizing antibodies. The patient resided in the town and seldom went elsewhere. Horses, however, have been known to contract encephalitis in the same county, so that the virus is probably to be found.

It seems probable that the St. Louis virus may likewise be responsible for human cases in these districts, since in 1938 encephalitis was reported in Riverside. At that time 6 (46.1 per cent) of 13 sera were positive for the St. Louis virus and none for the equine. The serum of one was weakly positive at first and became stronger after recovery. Seven sera did not react to either strain, although 3 of them were tested again several months after the onset. It seems likely that the St. Louis virus was responsible for this



small outbreak even though no active agent was recovered.

Because the eastern virus of equine encephalomyelitis has recently been reported in horses as far west as Texas,<sup>16</sup> there might be a possibility of such an occurrence along the Pacific slope. Sera have been received from many encephalitic patients in the coastal counties but all have been negative to the western virus. Likewise certain individuals in the central valleys have been clinically typical of encephalitis but without antibodies to the viruses used even after repeated tests. For this reason 11 sera from Kern County and an equal number from the Bay region and neighboring counties were tested against the eastern equine virus. Ten cases positive to the western strain from the valleys were also included. All sera so far have been negative except from one patient in Alameda County. He had been given large amounts of drugs and antimeningococcus serum as well, so that there is a possibility of an inhibitory action on the virus. Unfortunately no more serum was obtained to determine whether the blood became negative later.

#### DISCUSSION

From the clinical histories and from the results of many neutralization tests made each year, it seems evident that the virus of western equine encephalomyelitis has become endemic for man in California, probably for a longer period of time than can be estimated. Undoubtedly many cases have passed as non-paralytic poliomyelitis. Although the disease has never reached the epidemic proportions reported by Leake<sup>17</sup> in 1941 for North Dakota and the northern midwestern states, yet the constant recurrence each year in the same localities renders a burden on the community and leads to a condition of disquiet in the rural population during the summer season. It is true that

many cases recover without residual effects, but on the other hand all stages of the disease may be seen, hence the physicians are becoming cognizant that permanent defects to the nervous system may be expected. The neutralization test has been of value in the diagnosis of these cases that now are referred to the urban physician from rural communities for consultation. Often they appear many months after the acute attack, with eye defects, personality changes or a state of mental retardation bordering on imbecility. These residuals have been less frequent among adults, although eye troubles and headaches may persist for some time.

The history of a particular case illustrates the sequel. A 5 year old boy was taken ill in 1937. He had convulsions, was weak, emaciated, and was expected to die at any time, but recovered. His blood gave a positive neutralization test for western equine virus and was checked again in 1938. The boy improved physically but lacked coordination and spoke incoherently. In 1941, 4 years after the onset of the disease, he had grown strong but was mentally defective and still lacking in coordination.

Since it is now known<sup>12</sup> that the mosquito, *Culex tarsalis*, is capable of carrying the western equine and also the St. Louis virus, every precaution should be taken against mosquito bites in endemic areas; children especially should be protected. The attack rate of infants and young children under 12 years has been high in the valley regions, contrary to the findings of Leake<sup>17</sup> in North Dakota, where the adults were mainly affected.

In 1937, when cases of encephalitis first became of importance in the state, the evidence seemed to indicate the virus of St. Louis encephalitis as the active agent. Over 50 per cent of the encephalitic patients had neutralizing

antibodies for this strain in their blood but no virus was found.<sup>18</sup> After recovery of the western equine strain from man in 1938 and when the serum neutralization tests indicated the widespread incidence in these regions, the latter disease took precedence and the significance of the St. Louis encephalitis was correspondingly minimized. A combination of circumstances at the time of first reporting suggested that the antibodies for the St. Louis virus, especially if together with those for the equine, had been acquired previously. Many of the sera were from people in the older age group who could have had an earlier infection. Many individuals were migratory laborers and it was suggested that they had brought in the disease to the state or had acquired it through contact with their neighbors.

From experimental evidence and data collected since that period, it seems that the previous impression of introduction by the migrants, largely prompted by testing only human sera, should now be corrected. The finding of antibodies for the St. Louis virus in sera of horses, domestic fowl, and wild mammals, together with their presence in the blood of infants under 1 year, furnishes convincing evidence that this virus has been endemic in the state for some time, although it has not as yet been recovered from human or animal tissues. While there was no very marked difference in percentage between the number of tests positive for the St. Louis virus from normal people (15.7 per cent) and those with encephalitis (27.7 per cent), yet undoubtedly clinical cases are present.

It is probable that one is dealing with two types of encephalitis in the same community, due to two different viruses. Experimentally the strains are immunologically and serologically distinct, but by producing a mixed infection in monkeys it has been shown<sup>19</sup>

that a highly virulent western equine virus may take precedence, inducing the symptoms and the lethal effect. The equine strain is recovered post-mortem even though the St. Louis virus may be found in the blood during the first 48 hours after inoculation. Antibodies may be only weakly positive for the latter while those for the equine are promptly evident. It is possible therefore to have neutralizing substances in the blood due to a simultaneous infection with the two separate viruses. That this dual infection may explain the presence of both the equine and the St. Louis antibodies in the same human serum, has been proposed recently in regard to the outbreak of encephalitis in the Yakima Valley.<sup>14,15</sup> The possibility of the dual infection has been given further credence after recovery of both types of viruses from the mosquito as previously mentioned.

Mosquitoes have long been in association with both human and equine cases of encephalitis in California and since the disease is prevalent during the periods of greatest mosquito infestation and in irrigated, cultivated areas conducive to their propagation, it seems probable the same vectors are likewise the responsible agents for the encephalitides in this state.

#### SUMMARY

The study of encephalitis in California, based largely on the serum neutralization tests, may be summarized for the 3 years 1939, 1940, and 1941:

Of 498 human sera from cases of neurotropic virus disease in the central valleys including poliomyelitis, 213 (42.3 per cent) neutralized the virus of western equine encephalomyelitis, 55 (11.5 per cent) of 475 sera only the St. Louis strain, and 62 (13 per cent) both viruses. If the total amounts for the 3 years are considered, it is shown that 140 tests are positive only to the

western equine virus, exclusive of those in combination with the St. Louis strain, as compared to 55 for the latter virus alone or over  $2\frac{1}{2}$  times as many for the equine.

One hundred and forty-four sera from the San Francisco Bay region were negative to the western equine strain with only one (2 per cent) weakly positive to the St. Louis type, although 3 sera from other coastal counties reacted to the latter strain alone.

The western equine virus was recovered from 3 human brains and that of poliomyelitis from 3 others during the 3 year period.

There were over twice as many males as females among the total number of encephalitic cases, although when the ages were subdivided, no sex distinction was noticeable in the youngest age groups infected with the equine virus. All ages were affected by both types but the majority of cases were under 10 years for the equine, and in the years 13 to 30 for the St. Louis strain.

Cases of both the western equine and the St. Louis encephalitis were found mainly in the rural agricultural, irrigated sections throughout the two large Central Californian valleys with a definite seasonal occurrence for both diseases that rises to a peak in July or August or even into September.

A normal expectancy of 6.6 per cent positive neutralization tests for the western equine virus was found among the normal population in an endemic area as compared to 15.7 per cent for the St. Louis strain in the same environment. Consequently more reliance may be placed in the test as a diagnostic aid for the equine disease than for the other.

The sera of 32 encephalitic cases were negative to the eastern equine virus of encephalomyelitis.

Of a small group of sera tested from Southern California during the 3 years only one showed antibodies against the

western equine strain, although this virus has been isolated from horses in similar localities. Six cases of encephalitis from one county, however, had neutralizing antibodies against the St. Louis virus.

Occasional residual effects to the central nervous system may be expected after infection with the virus of western equine encephalomyelitis, especially among the children.

From the epidemiological, clinical, and laboratory evidence one may conclude that the virus of western equine encephalomyelitis has become endemic in the central valleys of California for man and animals and that the St. Louis strain is likewise closely associated. From the finding of antibodies in the sera of fowl and mammals in endemic areas and in children under 1 year of age, it is apparent that the St. Louis virus has been in California for some time and is not imported from the mid-western states as formerly proposed.

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# Tuberculosis Case Finding in Institutional Populations\*

The Use of 35 mm. Fluorograms Among the Mentally Ill

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IT has long been common knowledge that any institutional population is particularly subject to endemic diseases such as tuberculosis. Not only is there a high prevalence of the disease in populations of many institutions, but there are also characteristic and inherent difficulties in its control and treatment in any such situation, especially when the commitment of its inmates to the institution was not a result of the disease. The problems that arise may be considered as primarily epidemiological but complicated by financial and other practical considerations over which institution heads and staffs generally have only limited control.

In any but a tuberculosis institution, an administrator's concern about the disease assumes a peculiarly baffling and progressively serious nature as new advanced cases appear among the inmates. If, however, a hospital or other institutional superintendent had at his disposal a method by the use of which, at mod-

erate or small expense, he might identify early sources of tuberculous infection whose presence in his institution is most dangerous to it, a great part of his tuberculosis problem would be solved. It is with the use of such a technic that the present paper is concerned. Granting the importance of other aspects of tuberculosis control as they apply to a congregate population, the present discussion will be confined to the practical matter of early and accurate detection of cases of pulmonary tuberculosis in one type of institution, a state hospital for the mentally ill.

Among institutional populations, the mentally ill are numerically of considerable importance; in the United States nearly 500,000 such patients are hospitalized in state institutions alone. Of that number a significant proportion were tuberculous before commitment or have become so in the course of residence. Since the type of institutional medical care available in hospitals for mental patients does not effectively control the disease, the need for special tuberculosis case finding is felt perhaps more keenly in this sort of population

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than in any other. Especially is the statement true whenever hospitals for the mentally ill are handicapped by shortage of personnel or funds, and lack of facilities for chest examination, particularly by roentgenogram.

#### OBJECTIVE OF THE PRESENT STUDY

It was with some of the foregoing considerations in mind that the Division of Public Health Methods of the National Institute of Health and the Medical Unit of the (Minnesota) Division of Social Welfare began, in 1939, a co-operative experiment to test the efficiency of the 35 mm. fluorogram. The work previously reported by de Abreu<sup>1</sup> from South America and Holm<sup>2</sup> from Denmark had already served to strengthen the feeling that the 35 mm. fluorogram might well be the answer to the question of inexpensive mass case finding. There has now been tested in the Anoka (Minnesota) State Hospital a practical portable fluorographic apparatus which seems admirably suited for use as a screening device in large institutional populations, particularly in states with a number of institutions. The objective of the study was to determine the usefulness and accuracy of 35 mm. fluorograms in the roentgenographic detection of pulmonary tuberculosis.

The plan of testing was to take small (35 mm.) films and, for definitive diagnostic purposes, simultaneous large (14" x 17") x-ray films, of all patients who could coöperate, and of all employees. As the plan eventually worked out, about 400 of the 1,264 large films were taken some time before their corresponding small ones; but the remainder were taken simultaneously.

It was recognized at the outset that because of the nature of their illness it is difficult to obtain uniformly good x-ray films of mentally ill patients. Due to physical deformity, many patients could not be placed in proper position;

many also resisted the efforts of employees to assist them. It was in some instances, therefore, necessary to give the patients strong sedatives before attempting x-ray examination of them. It was necessary, almost routinely, to bind the upper part of the patient's body to the cassette, so as to obtain and maintain reasonably good positioning. In many cases the patients could not coöperate by taking a deep breath and holding it during the exposure. In evaluating results of a comparison of small and large x-ray films one must therefore remember the handicaps under which both were taken.

*Apparatus*—The apparatus for the experimental study is of simple construction and consists essentially of an H-shaped cast iron standard, a rotating-anode x-ray tube, and a light-tight metal box. The latter, in the shape of a truncated pyramid, has attached to one end a Patterson fluorescent screen (type B) and to the other a Zeiss Contax camera with an f, 1.5 lens. The camera is focused on the exact center of the fluorescent screen. The distance from the screen to the target of the rotating anode tube is 42". The machine is not expensive nor is it difficult to transport, and can be used with any transformer that will deliver a 150 milliampere current at 60 to 90 kilovolts. Such a transformer, usually found in state institutions, can easily be connected to the machine and can also be calibrated without great difficulty.

*Reading the films*—Prior to, and entirely independent of the reading of the 14" x 17" plates, 35 mm. films were read by transmitted light with direct magnification viewers (Leitz) by two physicians (H.E.H. and R.B.H.), neither of whom is a roentgenologist. It should be made clear that the object of the reading of the small films was not definitely to diagnose pulmonary tuberculosis, but rather to find parenchymal lesions of the lungs in all pa-

tients needing further study for final diagnosis. Accordingly, the 35 mm. films were classified as follows:

1. *Abnormal*, with immediately apparent clearly visible, definite shadows of the lungs that appear characteristic of reinfection type tuberculosis
2. *Suspicious*, with markings of any kind in the parenchyma of the lungs that could not immediately be interpreted as definitely abnormal but were also not within the range of normality of appearance
3. *Negative*, with no abnormal or suspicious markings in the parenchyma of the lungs, or with only the types of shadows ordinarily interpreted as representing calcification from first infection tuberculosis, or old thickened pleura

Later the 14" x 17" films were interpreted by a qualified roentgenologist with extensive experience in reading chest roentgenograms. The National Tuberculosis Association's recommendations were followed in classifying lesions as *minimal*, *moderately advanced*, or *far advanced*—with two additional categories, "reserved diagnosis or suspect" and "no reinfection type tuberculosis."

*The sample*—In the Anoka (Minnesota) State Hospital in the first 8 months of 1940, it was possible to obtain a 14" x 17" x-ray film and a 35 mm. film of reasonably good quality for each of 1,264 cases. The institution population was distributed by age and sex as shown in Table 1.

#### RESULTS OF THE SURVEY

As of January 1, 1940, it was known that 66 of the 1,264 patients in the hospital had reinfection tuberculosis. There were 39 minimal, 17 moderately advanced, and 10 far advanced cases, according to the N.T.A. classification. In addition to the 66 known cases of tuberculosis the 14" x 17" x-ray film survey found 180 new cases; 119 of which were minimal, 57 moderately advanced, and 4 far advanced. Of the total of 246 cases, representing 19.5 per cent of the population, 158 were minimal, 74 moderately advanced, and 14 far advanced. In addition, there were 56, or 4.4 per cent of the population, classed as "reserved diagnosis" cases.

As is shown in Table 2, the 35 mm. films were read as abnormal or suspicious in 301 cases, 23.8 per cent of the group examined. There were thought to be definite abnormal shadows in 182 cases (14.4 per cent) and suspicious lung markings in 119 (9.4 per cent). However, 11 of the 35 mm. films read as abnormal and 20 as suspicious were "over-read" since the corresponding 14" x 17" plates were interpreted as negative for tuberculosis. The "over-reading" applied, therefore, to 31, or only 3.2 per cent of the 962 negative cases. Errors of interpretation were due mainly to the difficulty, on small films, of visualizing the apices and the extreme

TABLE 1

Age	Total	Male		Female	
		Number	Per cent	Number	Per cent
Total, all ages	1,264	387	100.0	877	100.0
15-24	9	3	0.8	6	0.7
25-44	266	82	21.2	184	21.0
45-64	649	197	50.9	452	51.5
65 and over	340	105	27.1	235	26.8

It will be noted that more than two-thirds of the group were women and that the age distribution was quite similar for each sex.

periphery of the upper lung fields. However, aside from the 31 cases, examination of the 35 mm. films of 1,264 patients interpreted 13.3 per cent as

having definite abnormal lung shadows, and 7.3 per cent, suspicious lung markings.

Considering in each instance the reading of the 14" x 17" films as a standard, the 35 mm. films missed 11.4 per cent, or 18 of the 158 minimal, and 4.1 per cent, or 3 of the 74 moderately advanced

Case 2,406—Nodular tuberculosis in the left apex and fibrosis in the first interspace, also right apex, first and second interspaces.

(Apices are hard to visualize on 35 mm. x-ray pictures of uncoöperative mental patients because of the difficulty of obtaining deep inspiration and good positioning during exposure. Likewise, fine fibrosis is difficult to visualize on small films with present technic.)

TABLE 2

*Comparison of X-ray Findings on 14" x 17" and 35 mm. Chest Films by NTA Diagnosis on 1,264 Mental Patients at Anoka (Minn.) State Hospital, 1940*

Reading of 35 mm. Film	Total Cases	Diagnosis by 14" x 17" Film (NTA Classification)				
		Minimal	Moderately Advanced	Far Advanced	Reserved or No Reinfection Suspect	Type Lesion *
		Numbers				
Total	1,264	158	74	14	56	962
Abnormal or suspicious	301	140	71	14	45	31
Abnormal	182	79	60	14	18	11
Suspicious	119	61	11	..	27	20
Negative*	963	18	3	..	11	931
		Percentage Distribution (NTA)				
Total	100.0	100.0	100.0	100.0	100.0	100.0
Abnormal or suspicious	23.8	88.6	95.9	100.0	80.3	3.2
Abnormal	14.4	50.0	81.0	100.0	32.1	1.1
Suspicious	9.4	38.6	14.9	.....	48.2	2.1
Negative*	76.2	11.4	4.1	.....	19.7	96.8
		Percentage Distribution (35 mm. Readings)				
Total	100.0	12.5	5.9	1.1	4.4	76.1
Abnormal or suspicious	100.0	46.5	23.6	4.7	15.0	10.2
Abnormal	100.0	43.3	33.0	7.7	10.0	6.0
Suspicious	100.0	51.3	9.2	...	22.7	16.8
Negative*	100.0	1.9	0.3	...	1.1	96.7

\* Includes first infection type lesions and thickened pleurae.

lesions; but none of the 14 far advanced cases. In other words, the small film technic missed only 3 of the 88 advanced cases of greatest potential danger to the population group involved. Eleven of the 56 "reserved diagnosis" cases were read as negative on the small films.

The 3 moderately advanced cases (all found to be clinically inactive) which were missed in the reading of small films were also of types apparently difficult to interpret except on 14" x 17" plates of better than average quality. In order more fully to explain this statement, the large film x-ray findings for each of the 3 cases are given below:

Case 865—Old fibrosis both upper lobes, thickened pleura both upper lobes.

(Old fibrosis does not show up well on 35 mm. films if the linear or fibrotic markings are very thin, and especially if the case shows both fibrosis and thickened pleura.)

Case 1,305—Right lung was clear. There is extreme thickening of the pleura on the entire left side. Evidence of old tuberculosis in left apex and left clavicular region.

(The 35 mm. film showed an area of increased density over the entire left side, suspected as pleural thickening, but no markings were noted in the parenchyma.)

However, it may be said that review of the small films for cases 865 and 1,305, and direct comparison with cor-



responding large films, has indicated that these two types of lesions would rarely be missed in future readings of small films. Once seen, they are thereafter quite recognizable.

#### DISCUSSION

Tuberculosis creates serious administrative and epidemiological problems within institutions with large populations unless cases are diagnosed before they reach a communicable stage. Early and accurate detection of advanced cases is a matter not only of epidemiological, but also of economic importance both to institution heads and the general public alike. Primarily for the protection of the inmates and employees of the institution itself, it therefore becomes an obligation of the responsible officials of the institution to identify and segregate its communicable cases of tuberculosis. Furthermore, since many types of institutions (those for the mentally ill, among others) parole their inmates, there is further obligation to the general public not to release into it known sources of infection. All these advantages of early diagnosis are, of course, in addition to the more personal ones for the diseased individuals themselves.

In the type of institution in which this study was made, early diagnosis is especially advantageous in that, in states having a number of hospitals for the mentally ill, one may be set aside and used for the tuberculous. In that way specialized clinical and surgical services need not be provided in all institutions, nor need there be so many (usually part-time) trained consultants as would otherwise be necessary. Administratively, such a plan should work out quite well in that it is less expensive, more practical, and more effective as a means of communicable disease control than it is to have a large isolation unit in each institution.

In view of experimental results re-

ported here there appears to be an excellent place in the field of institutional tuberculosis control for the small x-ray film method. Although in the experiment the physicians who read the small films "under-read" 21 of the 246 films showing pulmonary tuberculosis, all but 3 were only minimal lesions and those were clinically inactive. If the testing apparatus had been used in actual practice as a screening device preparatory to further diagnostic testing with 14" x 17" x-ray films and appropriate clinical and laboratory procedures, its efficiency, in so far as the finding of dangerous cases is concerned, would indeed have been very high. On the other hand, the error of "over-reading" as abnormal or suspicious those films with no evidence of disease was also relatively not large—31 of 962 cases. Again, in actual practice, 31 large plates would have been taken unnecessarily—a not very serious loss considering the number of cases found and the size of the population examined.

However, there is every reason to believe that when technicians and the physicians who interpret films acquire further experience, both kinds of errors will be materially reduced. After they have handled a number of cases of a specific type, it seems reasonable to assume that the quality of films on that type can be improved, although there will always be some patients that are difficult or impossible to examine by x-ray successfully. When physicians gain more experience in what to look for in the small films and understand more fully the significance of what they see, interpretation will undoubtedly become more accurate.

The low cost of the 35 mm. fluorogram is obviously one of its strongest recommendations, if it is to be used in mass case finding in very large populations. Aside from the cost of equipment, electricity and the salary of the staff, each 35 mm. x-ray film costs

about 1 cent processed—or about 1/50 as much as a 14" x 17" plate. In addition, less personnel, time, and storage space are required for 35 mm. films than for larger films. A technician, an assistant technician, and a clerk, acting as a crew, can produce, depending on the coöperation of patients and employees of the institution, from 200 to 500 small films a day with ambulant subjects. In institutions whose inmates can coöperate (prisons, for example) the number per day can be doubled. Hence a unit, such as has been described, if used on a state-wide basis with a traveling crew, would ordinarily need to spend only a few weeks at any but the larger institutions. In most states at least one x-ray film a year could be taken of all suspected persons or even all not known to have tuberculosis, and adequate follow-up, an essential of tuberculosis control, could be maintained.

It should not be inferred from what has been said that the 35 mm. fluorogram is considered the only alternative to the 14" x 17" x-ray film. The paper film technic has been fully developed and such plates are much less expensive than standard 14" x 17" films. However, there is a tendency among many physicians not to accept paper films with the same degree of reliance as they do standard plates. Potter, Douglas, and Birkelo<sup>3</sup> have been very successful with a 4" x 5" film but the apparatus is quite expensive and the operating costs are greater (films, developing, storage, labor). Fluoroscopy is also satisfactory from a diagnostic point of view, but, again, it does not produce a permanent record of the kind considered adequate to guide subsequent clinical management; and, more important, there are few flouroscoipists in state institutions. Because of the restrictions involved in the use of any of the three methods just mentioned, it is believed that the 35 mm. fluoro-

gram offers the most practicable solution to the problem.

#### SUMMARY

A portable and inexpensive fluorographic unit, using 35 mm. film in a standard camera and transportable 200 milliamperere x-ray equipment, was tested in a state hospital for the mentally ill. Of the more than 1,200 patients, all of whom were tested, few could coöperate and many were deformed and otherwise physically not good subjects; yet the apparatus was efficient in discovering a very large proportion of the advanced cases of tuberculosis in the population. In fact, over 150 cases of tuberculosis, in addition to the 66 known before the experiment, were identified in the course of it. The readings of small films were checked against independent interpretations of corresponding standard x-ray plates, with the result that the errors of both over- and under-reading were found. In neither respect was the lack of correspondence great enough to cause concern about the essential accuracy of the technic as a screening device, even among uncoöperative subjects.

The results of the experiment lead to the belief that the technic and apparatus used are, even without further refinement,\* sufficiently accurate to warrant their widespread adoption by states for use among institutional populations, particularly if the state has a number of large institutions. Routine "screening" or identification of communicable cases of tuberculosis, and periodic rechecking of suspicious cases, would then be possible at a small fraction of the cost of using standard 14" x 17" x-ray film equipment. If also segregation and

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\* As a result of this preliminary work, the Division of Public Health Methods of the National Institute of Health has set up a comparative photorontgenographic study under Dr. Willis Beasley, psychophysiolgist, to make an intensive technical evaluation of these procedures. Dr. Beasley assisted in the development and construction of the experimental fluorograph used in this study.

treatment were further centralized, the advantages to the patients themselves, the institutional employees, and the general public would be very important not only from the point of view of communicable disease control but also from that of substantial economy.

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# Industrial Nutrition and the National Emergency<sup>\*</sup>

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IN the present national emergency, we are sparing neither men nor money to provide the best engines of war that we can contrive. In mechanized warfare, from 6 to 18 men must work at home for every man stationed in the first line of defense. The whole fabric of our industrial organization, which is the backbone of our national emergency, depends on the productive effort of the men and women in industry. Our modern knowledge of nutrition can make a major contribution to this effort whose benefits will remain long after the present crisis has passed.

There is an interesting example in a recent experiment which suggests how improved nutrition may, in an unexpected manner, alleviate the strain of work in industry. Rats are sensitive to high pitched sounds. Many rats, after a few days, are thrown into convulsions by exposing them to a high pitched note for one minute a day. These convulsive seizures occur whenever the note is sounded. It was found in young animals 2 to 4 months old already on a fairly good diet that the susceptibility to these seizures can be reduced by liberal supplements of the vitamin B complex. Although some improvement was obtained with thiamin alone, the best results were obtained by supplementing the diet of each rat with 20 gammas daily each of thiamin, riboflavin

and pyridoxin. This supplement with synthetic vitamins was as effective as 2 gm. of brewers' yeast daily.

It will be interesting to ascertain whether workers exposed to a great deal of noise require more than ordinary amounts of the vitamin B complex.<sup>1</sup>

It has been observed in Britain that the improvement of the diet of workmen which was not up to standard for good health was followed by increased output without any increased effort and also by a reduction in the number of accidents; as a result, many factories are now providing a good meal for their employees.

Nutrition workers have known for some time that men maintained on vitamin deficient diets become more easily fatigued and suffer from lassitude and loss of interest in work. The more active the person the sooner the severe symptoms develop. Other symptoms known to occur in vitamin deficient individuals are depressed mental states, soreness of muscles, and backache. The significance of these symptoms for men engaged in war work needs no emphasis.

These considerations would not concern us if it were known that our workmen consumed adequate diets; unfortunately the opposite is true. A number of studies indicate that millions of people in this country are living on diets below the safety line. It has been said "nutritional diseases in all probability constitute our greatest medical problem, not from the point of view of deaths,

<sup>\*</sup> Read before the Western Branch, American Public Health Association at the 12th Annual Meeting in San Diego, Calif., May 25, 1941.

but from the point of view of disability and economic loss."

In a well known survey carried out by Stiebeling and Phipard of the U. S. Department of Agriculture, it was found in four great geographical regions from coast to coast among employed non-relief workers that the distribution of good, fair, and poor diets was approximately as follows: poor 50 per cent, fair 35 per cent, and only 15 per cent were classed as good. The chief difference between "good," "fair," and "poor" diets is in the amounts of vitamins and minerals they contain.

The extent of malnutrition in this country is worse than these figures indicate because the diets classified as "fair" are in reality unsafe diets. The following were the standards for a "fair" diet:

Protein .....	50	gm.
Calcium .....	450	mg.
Phosphorus .....	88	mg.
Iron .....	10	mg.
Vitamin A .....	3,000	I.U.
Vitamin B <sub>1</sub> .....	333	I.U.
Ascorbic acid .....	30	mg.
Riboflavin .....	0.9	mg.

The amount of vitamin A is not sufficient for normal dark adaptation in many individuals. The amount of vitamin B<sub>1</sub> is barely sufficient to prevent beriberi, with no margin of safety. There is barely enough protein to prevent loss of body protein. The amount of vitamin B<sub>2</sub> is insufficient protection against cheilosis. It is an astonishing and disquieting fact that in a country as rich as the United States in food, transportation, and industrial organization, only 15 per cent of the employed workers had diets better than this.

A nutrition survey was carried out in Pasadena between May and August, 1938, under the direction of W. L. Halverson, Medical Health Officer of Pasadena, and the writer. Our findings in this region confirmed those of Steibeling and Phipard.

In any planned attack on malnutrition in the war industries we must consider the causes of the widespread malnutrition in this country. One of them is no doubt economic—29 per cent of the non-relief families during the years 1935 and 1936 in villages and cities had incomes below \$1,000 a year. It would have been impossible even with expert nutritional knowledge for these people to purchase a "good" diet. Investigation showed that only 25 per cent of these families bought "fair" diets, 75 were "poor." The economic factor would be the most important one if our objective were limited to the prevention of severe nutritional diseases such as xerophthalmia, beriberi, pellagra, and scurvy.

When optimum health is our objective, then the economic factor becomes of secondary importance. Referring again to the survey of Steibeling and Phipard, 43 per cent of the non-relief families living in villages and cities had incomes between \$1,000 and \$2,000 a year. In this group, where the economic factor is unimportant as a determinant of the quantity and quality of food provided, only 25 per cent had "good" diets, 65 per cent were "fair," which we have seen is really an unsafe diet, and 5 per cent were bad. In the group of families with incomes of \$5,000 or more, 65 per cent had "good" diets, 30 per cent were "fair," and 5 per cent were bad.

Anyone who has computed the amounts of the nutritive essentials in actual dietaries knows that even the well-to-do, who can eat what they want, as much as they want, and are reasonably intelligent about it, do not and cannot, unless they possess the necessary technical knowledge, obtain a diet which will afford optimum health. The chief difficulty is in obtaining enough of the vitamin B complex. What then is the situation among those whose incomes are in the middle and lower brackets?

How much could we save in dispensaries and hospitals if the middle and lower classes, who comprise by far the great majority of our population, had first class diets from childhood?

One reason for this widespread inadequacy in our diet is well known. Modern processes remove the vitamins and minerals from wheat, corn, and sugar in the milling and refining. Today less than 10 per cent of the vitamin B complex in the wheat grown in this country is actually eaten by human beings, although subclinical vitamin B deficiency is widespread in all economic classes.

There is no use in crying over spilled milk. The nation will not eat whole wheat flour and bread. Furthermore it would require profound changes in the milling industry. In attempting to solve industrial nutritional problems, we must, at least for the period of the emergency, use such methods as do not call for a revolution in processing methods, nor for great changes in eating habits. Or we shall fail. The new knowledge of nutrition with the aid of the new food technology can provide an optimum diet for all, if we will be rational about it.

Whatever measures are taken, there is one absolute prerequisite; that is that public health and other officers concerned with protecting our food have at least some appreciation of the new knowledge of nutrition. I heard not long ago of one of our state officers concerned with food and drug inspection who stated that he did not need vitamins, that very few people do. When informed of a recent federal rule that vitamins be classed as foods, he stated that he would do all he could to obstruct such a rule from becoming permanent.

I wish this outspoken officer would submit to the simple experiment of living on a diet which contained no vitamins for as short a period as 2

months on the familiar washed casein, cane sugar, lard and, possibly by way of indulgence, cow lick for minerals. He could be allowed water ad lib. If he survived the 2 months' experiment, I am sure he would become a zealous evangelist for vitamins. New converts are the most devout.

The education of the public to the harmful consequences of polluted drinking water and milk has greatly helped the public health officer in providing safe water and milk. In the same way, if the public knew that among the consequences of mild but prolonged nutritional deficiency disease in adults are, among others, the many aches and pains of middle and old age, defective vision in dim light, dyspepsia, thinning of the bones, it would be easier for public authorities to provide a richer vitamin and mineral intake in our staple foods, it would encourage food processors to provide the public with a variety of foods adequately enriched with vitamins and minerals.

Conversely, an informed public will appreciate the limits of what can be expected from improved nutrition. Many diseases and illnesses, for example, cancer, measles, diphtheria, pneumonia, cannot be significantly alleviated or cured by any conceivable increase in vitamin and mineral intake. It is well to be on guard against the uninformed enthusiast (public, private, or commercial); he is nothing less than a quack.

Turning now to the special problem of improving the nutrition of our workers in the war industries, whatever methods are chosen, they must satisfy these requirements:

1. There must be no disturbance in factory routine.
2. There must be no interference with production.
3. We must not, by trying to get men to eat unpleasant foods, give them cause for complaint.

There are many difficulties to be overcome in this field. The first is that the level of popular nutritional education is so low. This is responsible in part for the high percentage of so-called "fair" diets in the middle classes. Another difficulty is that people are slow to change their eating habits. Most people in this country refuse to eat whole wheat bread. It is more serious than a joke that many men simply detest green vegetables and will not eat them. Many will not drink milk. The common superstitions regarding acid and alkaline foods, many so-called allergies, and the necessity for keeping on the "alkaline side" deter many from eating citrus fruits. I am sure every reader can multiply such examples.

Another serious difficulty in the problem of industrial nutrition is the poverty of cooking and serving facilities in our factories and in the homes of these workers. This is especially true in the new industries which have sprung up so rapidly. For example, one important factory in this region contains cafeteria facilities for 3,000 men; there are 26,000 men employed in that plant. Another employs 50,000 men and has no cafeteria facilities. The most that it can supply is hot coffee. If one passes by such a plant at noon, he sees men sitting on the pavement or in their cars eating sandwiches made of white bread, drinking bottles of soft drinks. The neighboring "hot dog" and hamburger stands serve a thin meat or cheese sandwich, again on white bread. Only here and there does one see a bottle of milk. Fruit is even less in evidence, and vegetables are, of course, out of the question apart from the occasional innocuous pale looking lettuce leaves in a sandwich.

How do these workers eat at home? Here is a typical case. Four unmarried young men live together. One of them cooks for the four in return for which he does not pay any rent. The food consists essentially of some fried

meat which is quickly prepared. They fill up on potatoes, white bread, some butter, practically no fruit or vegetables, although they are living in Southern California, and cream for coffee, but no milk.

There is no prospect at present of obtaining space or facilities for either preparing or serving even one meal a day in these new plants. This is not intended as a criticism of the management of our war industries. They are concerned with the great problem of turning out airplanes, ships, and instruments of war as quickly as possible, and we must sympathize with them. Every available bit of space is used for production machinery. If we are going to be helpful, we must recognize their difficulties, accept their estimates of what they consider necessary in the way of plant machinery and plant routine, and adapt our recommendations to their difficulties as they envisage them. In any case, management knows the familiar and tangible problems of production. No one can criticize them for being unfamiliar with the less tangible factors such as the importance of good nutrition, especially when the effects are not immediately seen in production totals.

It is the task and duty of the nutritionist to try to improve the nutrition of the workers, and of the executives, without making demands which will curtail production, even temporarily. If we can do this, we have a case when we ask management and labor to be patient and wait for the long range beneficial effects of an improved nutrition to manifest themselves.

What lines of attack are open? The first line of attack which suggests itself is education in nutrition. Whatever methods are found suitable, I am certain that an intensive educational campaign will be necessary to insure the effective coöperation of both men and management. But it must be obvious

that if we wish to effect a significant improvement quickly, we cannot rely on education alone. As an example of the limits which can be achieved by educational methods alone, I may cite the case of milk—in the last 20 years, the per capita consumption of milk in this country has increased by only 4 per cent, in spite of a persistent and intensive educational campaign by public authorities from the federal government to teachers in schools. In addition, dairy products have now become expensive. I have already referred to the undesirability of attempting to disturb eating habits too much.

The special task of the scientific nutritionist is to ascertain what the nutritional problem is and, having ascertained what needs doing, to find practical remedial methods which management can accept. Our task does not end here. Whatever measures are adopted, to insure their effective and continued operation, a continued educational campaign must be planned and carried out in the plant and in the homes of the workers. The reasons are sufficiently obvious to need no elaboration here. We shall probably need and have to call on many social agencies. This, it seems to me, is the proper place of education in our national nutrition program—to assist positive measures, rather than to rely mainly on general education to improve the nutrition of the people. We have not time for that.

In this connection, I may quote from a recent article by Dr. W. H. Sebrell\* of the U. S. Public Health Service:

Just a few years ago, I took the point of view that the way to correct these conditions was to try to stimulate the increased consumption of foods naturally high in these vitamins. I still think that this point of view is correct theoretically. Although I recognize that such a program, if it succeeds at all, will progress so slowly that it cannot

meet the extensive deficiency conditions in our population today; therefore, as I see it, the next best thing is to add these vitamins and minerals to foods which are consumed in large quantities, especially by the low income groups.

The new food technology can be very helpful here. The development of synthetic vitamins and vitamin concentrates is one of the important technological advances of our time. Seven vitamins can now be obtained more cheaply as synthetics than from foods or other so-called natural sources. In a recent release, the National Research Council emphasized that synthetic vitamins are identical in every respect—chemically, nutritionally, and medically—with those in foods. The same is true of vitamin concentrates. Good preparations containing synthetics or concentrated vitamins can be valuable supplements to even a good diet, and even more to diets which are restricted for whatever reason. The points to be considered in the use of such preparations are as follows:

1. What purpose are they intended to serve?
2. Would the use of any given concentrate really eliminate the deficiency it is aimed at?
3. Are they a good buy?

Regarding the general principle involved in the use of concentrates and synthetics, it is necessary only to quote from a release from the National Research Council:

... There is ample reason to believe that any population receiving a diet fully adequate in vitamins, minerals, and other nutritive essentials is better able to withstand the stresses and strains of war or threats of war. Unquestionably, millions of Americans are not eating diets adequate in all essentials.

One significant point in this release is the absence of any mention of food as such: meat, milk, eggs, vegetables, and cereals. A food is adequate or inadequate to the degree to which it contains nutritive essentials. Nutritive essentials serve their nutritional purpose

\* Read at the conference of bakers, millers, and others to coordinate the introduction of enriched flour and enriched bread, Chicago, March 5, 1941.



whether they are grown in the field, salvaged from agricultural wastes and made edible, or entirely synthesized in a factory. One need only point to the profound change in modern medical therapy since synthetic vitamins have become widely available.

A step in this direction has already been taken in the fortification on a national scale of white flour with vitamin B<sub>1</sub> and nicotinic acid. The addition of vitamin B<sub>2</sub> so far is optional. It is desirable that fortification with vitamin B<sub>2</sub> be made obligatory in "enriched flour" as soon as possible, because vitamin B<sub>2</sub> deficiency is very widespread all over the country, much more widespread than any one of us suspected a few years ago.

Federal authorities now agree that all fats, butter, margarine, and lard should be fortified with vitamins A and D. By so doing, we not only add greatly to the nutritional value of the fats used by the poor—margarine and lard—but even the nutritional value of butter can be improved. For example, winter butter can in this way be made as nutritious as the best summer butter.

A few employers of labor in this country are already convinced that the productive capacity of their workers can be improved by improving their nutrition. In most cases, they have, at their own expense, supplemented the diets of their workers with vitamin concentrates. There are a number of reports in the press on this subject. It does not appear, however, that these efforts have been supplemented by an orderly and systematic study of the nutritional state of their workers before and after the vitamin supplements were

used, nor have they attempted to ascertain precisely what has been achieved by the vitamin supplement.

It seems to me that it is of the highest importance for public health nutrition that where measures such as these are taken the results of these measures be carefully recorded and studied. In spite of all the experimental work which has been done, the influence of diet on human health, on working capacity, on the incidence of accidents, and on the psychological state needs to be demonstrated by carefully organized and well controlled studies. We must be on our guard against extravagant statements and promises of what will be achieved. There can be no doubt that improvement in the health of the workers as a result of improved nutrition will be beneficial; but the particular respects in which these benefits will manifest themselves in this country remain to be demonstrated.

There is danger, of course, that the industrialist will be impatient and see in the scientific approach to these problems only another impractical academic survey which will take up a lot of time (of which we have none to spare at present) and money, and will end with unpractical and inconclusive results. Management must be made to see that, as an efficiency engineer cannot give any sound or useful advice without first appraising the existing mechanical situation, so the nutritionist must be allowed time, facilities, and opportunities to make a similar appraisal of nutritional status and facilities before he can make any useful recommendations.

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# The Rôle of Public Health in the National Emergency\*

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PUBLIC health undoubtedly faces one of the greatest challenges today since its evolution as a science. A horizon which seemed bright only a short time ago with opportunities for fulfilling long-sought public health aims and needs has been darkened. Today, we realize that these clouds are a threat to our many years of planning and accomplishment and that our very right to life, liberty and the pursuit of desirable objectives in coming years depends upon the strength of the defenses we build now.

No nation can profess strength whose people are physically unfit for efficient service. Consequently any intelligent war effort must give a large measure of consideration to the health status of its civilian and military populations. The present conflict is no ordinary war, but is primarily one between the total production and efficiency of the countries involved. In this light, public health assumes a rôle of importance second to none, not only in developing military strength but in producing the equipment for fighting, and in maintaining morale.

Total war presents tremendous problems which we can hope to solve only through intelligent coöperation, careful planning, and a willingness to sacrifice. There is a job for everyone and if our

total effort is to be successful there must be a unity of purpose and a clear understanding of individual responsibility in this supreme undertaking for national safety and security.

Public health workers are more than glad to do their share in meeting the responsibilities of these times, and the medical and dental professions have demonstrated a like spirit. However, it cannot be emphasized too strongly that necessary service on the home front is equally as important as service in the Army. Even though we recognize aggressive war as our No. 1 problem, it behooves us not to be forgetful that a major phase lies in holding the health gains already made. We are deeply concerned, and rightly so, regarding the steady depletion of our trained personnel, as one by one our health officers, nurses, technicians, and sanitarians, on whom there have been spent substantial sums of money for training and equipment, report for needed military duty. We have expected that we would have to make some sacrifices, but it seems necessary to insist that there be a more equal distribution of all medical facilities, or the consequences may be regrettable.

The whole problem of drafting and calling to active military duty personnel employed in public health departments was considered at a special conference of State and Territorial Health Officers in Washington a few months ago. It was recommended that, in plans for

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\* Presidential address delivered before the Southern Branch, American Public Health Association, at the 10th Annual Meeting in St. Louis, Mo., November 10, 1941.

the war effort, the work of the official public health agencies be recognized as an essential part of the national program.

In spite of the steps taken in developing the Procurement and Assignment Service, it remains to be seen just what can be done with the limited personnel available to cope with the public health problems which existed before the emergency and as well to take care of the multitude of new needs which the present crisis has forced upon us. The large concentration of troops in camps and cantonments and the tremendous influx of new population brought about through industrial expansion have created problems of great magnitude in communicable disease control, sanitation, housing, medical and hospital facilities, education, recreation, and in many other related conditions essential to social development and public health. The Community Facilities Bill passed by Congress is expected to meet some of the need by providing funds for hospitals, including quarantine or isolation hospitals, clinics, malaria control, schools, recreation buildings, and many miscellaneous items.

In the meantime, upon what should we concentrate from a public health standpoint to achieve the most good with what we have? We cannot hope to tackle all needs, so the logical procedure is to begin with the most urgent and work on down the list, achieving all we can. It is my opinion that the first and most important needs would embrace the following:

1. *Communicable disease control*—with special reference to the venereal diseases.

2. *Sanitation*—The very elemental phases of health work need more emphasis, particularly ordinary sanitation, safe water and milk supplies, protection of the food supply, sanitary methods of excreta disposal, and drainage.

3. *Industrial hygiene*—With production of tools and equipment being a primary essential to defense, the health of the worker

assumes a place of first importance. It must not be neglected.

4. *Rehabilitation*—Based upon the large number of rejectees we have had, which we feel is a good cross-section of the total population, it goes without saying that some action must be begun immediately to boost the physical status of these rejectees where possible.

The lesson that public health gains from the startling discovery that so many are incapacitated for active military service is that mere absence of disease does not imply that one is enjoying maximum physical efficiency and well-being. Consequently, the future will likely see greater emphasis than ever before on promotion and conservation of health as well as prevention of disease. It is time to begin applying on a universal scale the excellent store of knowledge we have been accumulating for some years for practising personal preventive medicine and hygiene. That knowledge, properly recruited, will strengthen immeasurably the nation's defenses. It remains for public health to assume the leadership in putting it to work, instilling in people a greater sense of personal responsibility for health.

The health status of our civilian population as reflected in the large percentage being rejected by the Selective Service boards is of grave concern to public health officials, and we should like to get something done about it. Even though it is impossible to correct the whole situation, 20 to 50 per cent of those involved are considered susceptible of rehabilitation.<sup>1</sup> Last October President Roosevelt indicated to his press conference that a plan is being developed for rehabilitation of the draftees who are classified at the time of their first physical examination as being susceptible of rehabilitation at a reasonable cost in a comparatively short time. To those who were doubtful about the possibility that draftees would

volunteer for rehabilitation or that they could be forced to correct remedial defects, the President responded with some legal opinions as to how such rehabilitation might be compelled once the draftee came under the control of his Selective Service board. Such a program would be largely experimental at first until sufficient evidence has been accumulated to make the process wholly effective. There is a note of hope in the President's proposal which promises some solution to a very complex problem, and which no doubt will exert a helpful influence on the whole civilian population in building physical fitness. The hope remains in spite of the delays which have followed.

The question was advanced at a recent Conference of State and Territorial Health Officers<sup>2</sup> as to whether American public health, within its present framework of organization, is equal to the task of supporting and enhancing military and industrial mobilization and at the same time not seriously depleting the program which has taken years to build. It is apparent that there must be some solution for meeting both civilian and military needs, for if the health of either group lags, the other will ultimately suffer from it. Consider, for example, how much time the soldier spends in territory outside the camp. What will it profit him to have the best of protection in camp if the first time he steps into the surrounding civil communities he contracts some infection which he brings back to menace the rest of the troops? Military public health in the long run, therefore, depends upon the status of civilian public health, and no more important preparation for national defense exists than meeting the health needs of both groups.

We are resolved, therefore, to do the best we can with the personnel and resources available—this in spite of the increasing number of public health

problems and the decreasing number of trained workers to fulfil present needs. Dr. Thomas Parran<sup>2</sup> tells us, after making some firsthand observations in England, that—

If we are to learn anything from the British experience on the medical front, we must reorganize our approach to the problem of medicine's contribution to the defense effort. The medical needs of the civilian population should be considered in all recruitment plans, and should be balanced against the military needs. . . . Medical personnel for military, industrial, and civilian health and medical services should be recruited on a quota basis, having in mind the service which each individual physician can render best. . . . The successful local organization of medical defense effort in Great Britain was possible because for two decades or more Britain has had a nucleus of trained medical officers of health. Without this nucleus, effective local medical defenses could not have been organized. We should take steps promptly to double the number of doctors with training and experience in public health and medical administration. In addition, there should be a comparable increase in public health nurses, sanitary engineers, sanitary inspectors, laboratory technicians, and other technical public health personnel. New training centers will be needed for the training of key persons who in turn will train others who will work under supervision in local communities.

Amid the demands and frustrations of our present crisis, such ideals do not seem possible of early realization. However, I do not believe it is too early to begin looking toward that day when peace shall come upon the earth again, and to make our preparations accordingly. For without doubt, we shall face a world in which many values will be changed, both social and economic, and many new responsibilities will be presented which we must be ready to meet. Public health has met the challenges of past crises, and has through its experiences in them developed new and improved technics which proved beneficial to succeeding generations. Let us hope that when we have emerged from the

present conflict, our contribution to lifesaving methods will have offset in some measure the tragic toll of the battlefield. Since we live in a day of almost revolutionary achievement, I sincerely feel that public health will not be found lacking in the advances which

may be made, or in meeting the demands of the future.

#### REFERENCES

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# Memorandum Regarding Minimum Educational Facilities Necessary for the Postgraduate Education of Those Seeking Careers in Public Health\*

IN view of the confusion which exists regarding facilities necessary for the proper education of professional public health personnel it seems timely for the Committee on Professional Education to state its present opinion. For the benefit of appointing bodies, teaching institutions, and candidates for a professional career in public health, the committee here sets forth what it believes to be the minimum facilities necessary for the adequate training of professional workers. It is subject to change and elaboration as experience accumulates.

## I

Since public health itself is a specialty, all professional service in public health requires special education over and above the training inherent in the profession from which the candidate comes. For example: a physician entering the field of public health, already fully trained in clinical medicine, must also acquire competence in public health administration, epidemiology, vital statistics, community organization, etc.

## II

To their great credit many present and past public health leaders obtained their training largely by experience. We recognize their attainments and acknowledge our indebtedness for their pioneer accomplishments. Nevertheless, (a) with today's rapidly accumu-

lating knowledge, (b) with the increased legal, social, and economic responsibilities of the public health profession, and (c) with the development of many superior teaching institutions, we believe special professional training in public health is best obtained at a well equipped teaching institution. Such training should be at the graduate level, that is, after earning the professional degree.

## III

Special professional training for a public health career should include:

1. Skilled, organized, well integrated instruction, including laboratory exercises, under a variety of teachers who are recognized leaders in their respective fields, including a central group of those who devote full time to the teaching of public health.
2. Supervised field observation and experience in one or more well organized official or voluntary health agencies.

## IV

1. There is great advantage in obtaining this special training in a teaching institution having immediate access to and coöperative assistance from the faculties of schools of the medical and biological sciences, engineering, education, social and political science, economics and business administration. While not all professional public health personnel need full

\* Adopted by the Committee on Professional Education of the American Public Health Association, April 17, 1942.

- competence in all these broad fields, some will need considerable familiarity with several of them.
2. It is essential that the institution essaying to train professional public health personnel at the graduate level have a good library for reference work and ample laboratory facilities where students may have adequate space and apparatus to develop skills in such fields as bacteriology, engineering, statistics, and the like.
  3. It is likewise essential that such an institution have access to well organized health departments and voluntary health agencies which are willing to assist the school by providing facilities for supervised field training and experience. The performance standards of these agencies should be satisfactory to the school and their procedures familiar enough to the school so

that its teaching methods may be correlated with the student's observation.

4. There is considerable advantage in having all necessary facilities for training all types of professional public health personnel in the same institution so that they may participate together in certain basic courses.

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## THE PUBLIC HEALTH ADMINISTRATOR AND THE WAR

AS the strategy and economy of war develops, all local, personal, and group interests must give way to the national needs. This is a hard lesson to learn. To many it is distressing even to entertain such a thought. Faced with the oncoming shadow of deprivation and sacrifice, one is inclined to expostulate and remonstrate, fearing perhaps that if he does not do this his rights will be more adversely affected than will be the case with those who cry to high Heaven. One is naturally appalled, too, to find threatened the things to which he has given his life. But this threat to things is not nearly so serious as is the threat to life and soul; and the latter threat is essentially the one which each man and woman in every walk of life today faces: an inexorable and universal threat that all must meet. One may meet it in good spirit, courageously, and generously, to the benefit of his country and the glory of his own soul; or he may acquiesce half-heartedly, grudgingly, and stubbornly, to the jeopardy of the nation and his own deserved and final self-damnation.

How does all this relate to public health? Well, for the past year and a half there has been much speculation as to how war would affect (1) the public health, (2) public health work, (3) public health workers, and (4) the recruitment of new personnel. Actually, from a broad national standpoint, the first consideration is the only one of real importance, for in comparison with the necessity of maintaining the public health, the *way* in which this is done, by *whom* it is done, and the personal fortunes and comforts of those at present engaged in public health work fade into insignificance. While this philosophy has by now been generally accepted by those responsible for the public health, some have not yet reached the articulate and action stage. That this is the case was evidenced in the proceedings of a recent conference on public health and the war. This was attended by many public health administrators. In the early stages of the discussion, perhaps for the greater part of it, those present seemed to be chiefly concerned with how in the face of military demands they might maintain their staffs intact or nearly so. Beyond a doubt many of them had sustained grievous losses in personnel, and their evidence of distress was received with due sympathy. But



the conference seemed to get nowhere. The members were restless. One sensed that, while they regarded as serious this draining off of trained workers and the inability to replace them with similarly trained personnel, they felt it to be only one part of a situation which badly needed to be discussed from a broader standpoint. And then, amazingly, the air was cleared by two or three speakers who took an entirely new tack. They called attention to the fact that there is a war on, that in pursuing this war, and in spite of the morale-designed emphasis on the importance of civilian defense, armed forces after all play a part of some importance; that for the man power of these armed forces there must inevitably be a bottom-of-the-barrel scraping of physically fit individuals under 45 years of age; and that in these circumstances it becomes the duty and privilege of public health administrators so to shape their organizations and so to bend their programs as to yield generously, and even completely to the armed forces those on health department staffs who are competent, and fit, to serve in a military capacity. These speakers went on further to point out that the responsibilities of public health administrators were not to keep their staffs intact, but to maintain the health of the public regardless of the shortage of already trained personnel they might have to face today or tomorrow.

It was heartening to witness the responses to these perfectly clear-cut, logical, and realistic suggestions. Many of those present seemed for the first time to realize that in this emergency public health work *could* and *must* be carried on by older men, by men not necessarily completely robust, by women; that, in contrast, active, rough-and-tumble military duty can be sustained only by the young and hardy. These administrators were realists enough, too, to appreciate that in numbers, the under 45 years of age and physically fit individuals are necessarily limited; and on the basis of their experience they were quick to see that, just as in a budget, disaster invariably follows when a number of executives are drawing on the same item, so only one authority may wisely draw upon or hold in reserve the physically fit professional group in public health. In most instances, the authority so to draw must rest with the Procurement and Assignment Service, which in this field is the agency officially designated to meet the needs of the Army and Navy Medical Corps, and of civilian populations.

Generally then, it may be said that public health administrators are adjusting to meet the new demands. As the situation becomes more sharply defined, two things stand out clearly. The first is that the military services must have prior claim on public health's tough and active workers, and the second, that the problem which administrators in this field face is not to preserve public health organizations and staffs as they were, but to maintain the public health in spite of inadequacy in personnel. And they will do this. Public health officers are not themselves so far spent that they are unable to stoop and rebuild, even though it must be done with untempered and sometimes worn tools.

### AN ADOLESCENT GIANT STIRS

UNDER a release date of March 30, the United States Public Health Service announced that a three day conference on the conservation of man power in war industries would be held in Washington, April 9 to 11. This announcement went on to state that "Even in normal times, 400,000,000 man-days are lost annually in industry because of sickness and accidents. A large part

of this wastage can be prevented. Representatives of the medical profession, governmental industrial hygiene services, management, and labor will participate in the discussion of ways and means to reduce industrial disability."

The meeting in question was held last month, so it is no longer news. It is nevertheless significant, for such an approach to the problems and practice of industrial hygiene is a far cry from the old factory's dingy first aid dispensary. A comprehensive attack like this is quite different, too, from the situation which existed in industrial hygiene when the most stable of its personnel was the small town "railroad surgeon," not always chosen for his skill, whose principal duty was an occasional amputation and whose retaining fee was a railroad pass for self—and for family, if possible.

Today, not only are the problems in industrial hygiene far more extensive in their range and more complex in their make-up than formerly, but practice in this field demands quite a different type of individual. In fact, to meet the needs, there must be a staff of experts rather than one person. The medical man on such a staff is far more concerned with placement-employment and with prevention of disease and disability than with salvage after accident or disaster. He must be detailedly informed as to manufacturing processes and alert as to their potential dangers to the workers employed. This industrial physician, too, must be a good enough practical psychologist to know the limits in precautions which human beings are likely to observe under stress of monotony and fatigue, and the physical and mental demands of the various jobs. Not only must he be a good clinician, but a pre-clinician as well if he is to discover trouble in its incipency. And finally, he must be able to interpret both to management and to labor the dollar and cents value of the money and effort spent.

Medical measures, though extremely important in industrial hygiene, do not by any means occupy the entire field. Engineering work is vital in lighting, heating, ordinary ventilation, and in air conditioning and removal of dust and fumes; in the guarding of dangerous moving parts of machinery, in the provision of adequate washing and toilet facilities and their placement, even in the character of flooring and the kind and time of cleaning done. The chemist also plays an extremely important rôle in making safe the handling of toxic or irritating materials or in finding substitutes for them, and the physiologist is much concerned with questions related to fatigue, varying pressures, lights and temperatures, and tolerances of one sort or another. The interest and coöperation of employers is essential too, if industrial hygiene services are to be organized and maintained, and understanding, appreciation, and support, on the part of labor must be insured.

It is easy to see that in this field there has been a bursting of old bounds. New qualities and new quantities, and new problems and new practices have arisen. Industrial hygiene no longer limits itself to preemployment examinations and first aid. Instead, it relates to all those measures, procedures, and precautions which are designed to make reasonably safe the working conditions of those in industry and which contribute directly or indirectly to the maintenance of the workers' health and efficiency.

# Credit Lines

A Selective Digest of Diversified Health Interests

D. B. ARMSTRONG, M.D., AND JOHN LENTZ, M.S.

## AN EDITORIALETTE:

### ALWAYS AND NEVER

"The trouble with medical training is that it is too individualistic and ultra-conservative"—a criticism heard not infrequently, especially at this time, with the broad trend toward socialization of all types of services, now to be materially accelerated by the war. Presumably medical organization should and will be adapted so as to make possible a greater social use of medical services, though it is profoundly to be hoped that its basic anchorage in the traditions of private medical practice will not be completely sacrificed.

Always, if there are to be real doctors of medicine, the study of disease must be highly individualized. It is people as individuals who are sick with human pathology. They must be treated and cured individually, and, now that personal hygiene is superimposed upon public sanitation, their diseases must also largely be prevented individually.

The medical student of human diseases finds an infinite variety of manifestations, and few if any hard and fast rules. The signs and symptoms with which he must become familiar are not statistically as classifiable as are births and deaths. Those who deal with more tangible facts and figures seem to the doctor a little too facile in drawing conclusions from medical data. The average, well trained doctor of medicine sometimes feels that if he could be as sure of *any one thing* in medicine as

some of his non-clinical colleagues are regarding *everything in medicine*, he would be a most fortunate doctor indeed.

Then, too, the doctor finds ideas and opinions in his art changing a little too rapidly to validate the concept of fixed and incontrovertible facts in medicine. He remembers, for instance, the recent history of poliomyelitis. He remembers back in 1912 when flies were definitely identified with the transmission of this disease. He recollects that this idea was unconfirmed and rather completely repudiated, now to come back strongly into the poliomyelitis epidemiological picture. He remembers when poliomyelitis virus vaccines were enthusiastically applauded, and then discarded. He readily remembers the ups and downs of nasal chemical blocking—over-exploited by lay writers in the popular medical science field. He recollects when the respiratory tract was considered by nearly all scientists as the one channel of entry of the poliomyelitis virus. Despised and spurned were those few crying in the wilderness about the importance of the gastrointestinal tract, which now comes very much into the limelight. Finally, he hears of the traditional and universal therapeutic splints being discarded for a hitherto unheard of but widely acclaimed physiotherapy.

From this it would appear that a degree of skeptical pessimism in medicine is a rather healthy state, out of which the physician must from time to time be shaken, if he is to participate in and contribute to organized medical and preventive medical progress—a dislodgment usually accomplished by the more

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optimistic social promoter or health educator. Yet there seem to be in medicine few if any "eternal truths," and perhaps only succeeding facets of the evolving and growing body of knowledge. To some men in clinical medicine all this must frequently refresh their memories of their professor of medicine, who was accustomed to orient his class at the beginning of his lecture series by admonishing the embryo physicians that "there are two words that do *not* appear in the vocabulary of medicine—*always* and *never*."

(Editorial Note: Third and last call! Won't you help us continue this series of "editorialettes"? There must be many subjects in the field of health education upon which you would like to express an opinion. Let us have your thoughts on any of these subjects. You may praise, criticise, or philosophize—provided it is done in not more than a hundred words. While we cannot guarantee publication, serious consideration will be given to your contribution.)

#### DISSENTING OPINION

Since the government embarked on its ambitious program to induce Americans to eat their way to health, we have had an opportunity to examine much of the literature and other publicity material which certain federal agencies, health organizations, and commercial enterprises have issued for popular consumption. We find that, with few exceptions, these materials are not sufficiently convincing or appealing to arouse Mr. and Mrs. John Q. Public to the importance of good nutrition. We have tried our hand at it and are ready to admit that nutrition is a difficult subject to publicize. Just why our efforts to date have been singularly lacking in popular appeal is anybody's guess. Perhaps we have yet to find the proper popular approach which the advertising specialist calls "the selling angle."

We wonder how the average person

reacts to the nutrition literature that is handed out here, there and yonder. Surely much of this material is read and the advice in it followed. On the other hand, a great deal of it must be cast into the nearest wastebasket. And we hardly blame the recipients. At this point, many people are "fed up" with nutrition (if we may turn a phrase!). And why not? The nutrition messages stem from so many sources and so many products are "plugged" as having outstanding nutritive values that we suspect a large proportion of the public is beginning to look upon the educational program as akin to a great sales-promotion venture. To add to the confusion, we are told by one authority in the field of nutrition that much of the so-called educational material now in circulation actually contains misleading information.

It would be too bad if this campaign missed the mark. Public health workers have demonstrated that they can perform a task of this nature magnificently—as evidenced by the nation-wide syphilis campaign. But the nutrition program, like Stephen Leacock's horse, seems to be "running off in all directions." As one authority sums it up: "Everyone is a nutrition specialist these days."

Now is the time to vitalize this campaign through the distribution of more effective educational literature sponsored by or endorsed by recognized scientific agencies. There is no place in this program for the flood of handouts obviously designed to promote the sale of certain food products. Any original and appealing ideas that will help "put over" the nutrition message will be welcomed and duly broadcast in these columns.

If you do not agree with the observations made here—speak up. We welcome rebuttal.

#### FILM NOTES

"Tuberculosis is sand in the gears of democracy's victory machine." Upon

this theme the National Tuberculosis Association has fashioned a new motion picture that is entertaining, instructive, and keyed to the stirring enterprise of winning the war. The picture is entitled, appropriately enough, "Sand in the Gears." It is an unusually good film which moves from beginning to end with the brisk tempo of a newsreel. Its timely message, lively pace, interesting photography, narration, and music make this a picture that all types of audiences will welcome.

"Sand in the Gears" pictures America as a great industrial giant whose future depends upon "three musketeers—the soldier, the sailor, and the laborer." The film stresses the fact that tuberculosis can easily sabotage our war effort as the heightened tempo of wartime industry is especially conducive to the spread of this disease. The resources which are available to combat tuberculosis are described and the audience is left with the feeling that we are well armed to carry out the fight against this ancient enemy.

One could criticise the film on only two counts: (1) Relatively too much emphasis seems to be placed on public facilities for tuberculosis control, with little or no reference being made to the rôle of the private practitioner, and (2) no mention is made of the growing tendency to employ women in war industries—a fact that will certainly have a bearing on the tuberculosis problem.

"Sand in the Gears" may be obtained from state or local tuberculosis associations or from the National Tuberculosis Association, 1790 Broadway, New York, N. Y. Tell your local theater manager about this picture. It has sufficient audience appeal to warrant its use on any theater program.

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A set of seven silent film strips has been issued by the Metropolitan Life Insurance Company to accompany the booklets which make up the company's Health Heroes Series, a group of seven

biographies of prominent physicians and scientists. The film strips of the Health Heroes Series have recently been thoroughly revised. New scripts were prepared for each, with the advice and coöperation of various public health and educational leaders. The film strips are illustrated with authentic pictorial material gathered from notable collections in medical libraries, archives, and from other sources. While the strips are produced primarily for schools, they are also suitable for adult audiences. The series includes the following titles:

*Madame Curie and the Story of Radium*—This interpretation of Madame Curie's life, her devotion to scientific research, and her achievements is particularly appropriate for use in cancer control programs.

*Edward Jenner and the Story of Smallpox Vaccination*—The life of the great physician who discovered smallpox vaccination is portrayed against a background of contemporary events and personalities.

*Robert Koch and the Discovery of the Tubercle Bacillus*—Koch is presented as the young naturalist who became the father of bacteriology and opened a new era in public health.

*Florence Nightingale and the Founding of Professional Nursing*—The dramatic story of the first great nurse and her influence upon the profession turns modern at the end with a series of pictures depicting the variety of nursing careers open to young women today.

*Louis Pasteur and the Germ Theory of Infection*—The glory of scientific achievement is felt throughout this brief but inspiring story of the great scientist's life.

*Walter Reed and the Conquest of Yellow Fever*—The history of Walter Reed and his gallant helpers who led the attack upon yellow fever is, as its opening title claims, a great detective story.

*Edward Livingston Trudeau and the*

*Crusade Against Tuberculosis*—In this film, Trudeau's life story merges with the story of public health's great triumph over tuberculosis.

The film strips come in 35 mm. size and may be used in a delineascope or other slide projector equipped with a special attachment designed for running film strips. They are given without charge, upon request, as a permanent addition to film libraries of health, nursing, and educational organizations. Write to the Welfare Division, Metropolitan Life Insurance Company, 1 Madison Ave., New York, N. Y., for prints.

#### RECENT HEALTH PUBLICATIONS

You will want to see . . .

*The Nebraska Health Almanac for 1942.* Almanacs and mail order catalogs have always held a peculiar fascination for the public. Little wonder then that the Nebraska State Department of Health saw fit to issue a health publication designed—as was occasionally done years ago—along the familiar lines of an almanac. It is our belief that this publication will be widely used by the citizens of Nebraska and that at the year's end, copies will be as well thumbed and dog-eared as once was the family almanac. The publication is well stocked with current public health information and in addition contains a great deal of historical material. (Incidentally, we were amused by one typographical error in the Almanac which reads: "Wednesday, April 8, 1869, Harvey Cushing, pioneer *train* surgeon was born.") The Almanac is delightfully old-fashioned in appearance and up-to-the-minute in educational content. Write to the Nebraska State Department of Health at Lincoln for copies.

*Annual Reports and How to Improve Them.* The Social Work Publicity Council, 130 East 22nd Street, New York, N. Y., in announcing this publication states: "Here's your inoculation

against annual report fever—here's your special treatment to prevent frayed nerves when annual reports are being prepared." We agree that this excellent guide, from the knowing pen of Mary Swain Routzahn, is "just what the doctor ordered" for all those who struggle with annual reports. This 20 page guide offers a wealth of information on how to make a report interpretative, readable, informal, and attractive. Of special interest is the fact that it tells how to produce inexpensive annual statements. Mrs. Routzahn discusses annual reports from widely differing fields of public service, in the hope that such "case histories" might be helpful to report-writers in improving their own work. This excellent publication may be secured from the Council for the slight consideration of 50 cents.

*Why Does Tuberculosis Run in the Family?* The National Tuberculosis Association is distributing a new publication with this title. It was written by H. E. Kleinschmidt, M.D., the Association's Director of Health Education. For a discussion of the factors of heredity and resistance, measured against environment and exposure, this statement by Dr. Kleinschmidt, designed for the interest of the intelligent lay reader, excels anything we have seen in this field in clarity, simplicity, and intelligibility. Sections in the pamphlet, dealing particularly with home infection hazards, are especially commendable. The publication is highly recommended for welfare workers, nurses, teachers, and others. Consult your state or local tuberculosis association for copies.

*All Eyes!* This is the title of the twenty-seventh annual report of the National Society for the Prevention of Blindness, Inc. Year in and year out this organization issues annual reports that are distinguished by their neatness, compactness, easy readability, and photographs that rivet one's attention. The 1941 report is prefaced by a thoughtful

and timely foreword in which the society's president, Mason H. Bigelow, stresses the importance of good eyesight to our present military and industrial effort. The body of the report is devoted to a resume of the year's work which reflects, as always, an admirable record of service. This is the type of report one wishes to file and keep, so well is it executed. Write to the Society at 1790 Broadway, New York, N. Y., for copies.

*HEALTH—You Owe It to Yourself*, a leaflet issued by the Council of Social Agencies of the District of Columbia, 1101 M Street, N.W., Washington. This publication is planned for distribution to rejected draftees. Its contents will be extremely helpful and encouraging to young men who feel that rejection renders them useless for any type of war work. Specific directions are given in the leaflet regarding those agencies in the community that are available for the treatment of diseases and the correction of defects. A publication of this nature could be used to great advantage in all communities. If interested, write to the agency mentioned above for a copy.

*What Is Heart Disease?* This folder, issued by the California Heart Association, 277 Pine Street, San Francisco, is decidedly "flashy" and modernistic. In fact, one might wish that a little less novel presentation had been used by the association to inform the public of its program. Yet the text of the folder is well written and attractively illustrated with stylized drawings. While we do not "go" for too much modernism in health literature, we grant that this particular publication will stand out from the general run of health pamphlets and will therefore be popular with the public. We like the slogan which this folder carries: "Heart disease over forty—It may be weight—not fate!" Copies may be had by writing the organization at the address given above.

*Prostitution and the War*, Public Affairs Pamphlet No. 65, by Philip S. Broughton. Here is a complete and thorough-going analysis of the rising problem of prostitution on both the home and fighting fronts. "We can't afford the germs of syphilis and gonorrhea any more than we can afford the less deadly human saboteur," says Mr. Broughton. In this 30-odd page pamphlet, the author makes it abundantly clear why no sane community can allow the modern prostitution racket to keep a foothold within its borders. The pamphlet contains some interesting descriptive material on social conditions that have grown up in industrial centers. It also outlines the work of public agencies that are concerned with the control of venereal diseases. A notable feature of this study is the author's sane viewpoint toward prostitution. He maintains that "prostitutes are people" who, if handled with skill and understanding, can be rehabilitated. Stamping out prostitution is a broad community enterprise and Mr. Broughton calls upon all the public, voluntary, and private community services to help do the job. This excellent study has substance without preachment and moralizing. *Prostitution and the War* may be obtained at 10 cents per copy by writing to the Public Affairs Committee, 30 Rockefeller Plaza, New York, N. Y.

"IT'S AS SIMPLE AS THAT—"

Breathes there a health educator who has not spent hours staring into empty space while trying to reduce to simple terms the pontifical utterances of the experts? We admire the scientists' capacity to observe and record, but one could wish that their observations and deductions were expressed more frequently in clear, simple language.

As a simplifier of ponderous phraseology, President Roosevelt is a master. He clearly demonstrated this ability recently when a government official

wrote a letter on the subject of blacking out federal buildings during air raids. The letter, bristling with polysyllabic profundities, stated:

"Such preparation shall be made as will completely obscure all buildings occupied by the Federal Government during an air raid for any period of time from visibility by reason of internal or external illumination. Such obscuration may be obtained either by blackout construction or by termination of the illumination."

Upon reading this, the Chief Executive ordered a re-write job. "Tell them," he said, "that in buildings where they have to keep the work going, to put something across the window. In buildings where they can afford to let work stop for awhile, turn out the lights."

Here is a lesson in simplification which is well worth the study of every health educator—and here also is one example of why our President is so well understood by the general public.

#### ARE YOU AN AUDIENCE ENEMY?

Although the A.P.H.A.'s Annual Convention is not scheduled until October, there are probably many prospective speakers who are already at work on papers and addresses to be delivered at the 1942 meeting. Naturally every person who is to appear on the program wants to put his or her best foot forward—so we pass on to you certain helpful excerpts from an article by Dr. Eugene F. DuBois entitled "Audience Enemies" and published in *Science*, issue of March 13, 1942.

Dr. DuBois lists six audience enemies whose minor and major defects are best calculated to torture a scientific assemblage. Heading the list of audience enemies is The Mumbler, who drops his voice to emphasize important points or else talks to the lantern screen instead of the audience. He is apparently more interested in excreting words than in con-

veying information. The Slide Crowder comes next. He packs his slides with typewritten data and shows too many slides, as if to demonstrate his industry. He also wields a pointer or employs a flashlight that projects an arrow that swoops and darts all over the screen and ceiling like a hornet. A good slide—carefully drawn in India ink and stripped of all nonessential words and figures—needs no pointer-wielder. Then there is The Time Ignorer, who talks beyond the limit specified in the program or justified by common courtesy. He is evidently over-impressed with the idea that his paper is much more important than the program committee had imagined. Occupying fourth place is The Sloppy Arranger, who jumbles his material in a way best calculated to confuse the audience. He may have in the back of his head the idea that he can lead up to a climax and hold the audience in breathless suspense until in the very last sentence he can prove that the venous blood of the wimpus contains only 3 milligrams of gadgetyl chloride instead of 4 milligrams. Would it not be kinder to the audience if he followed newspaper technic and gave in a headline, early in the talk, some idea as to what and wherefore? Audience enemy number five is The Lean Producer whose paper consists of trivia, errata, omissia, et cetera; mostly et cetera. Last on the list is The Grasping Discusser, who can spoil almost any meeting. If he has been invited to open the discussion he has probably prepared a nice little paper of his own with scant reference to the paper upon which he was supposed to comment.

It is suggested by Dr. DuBois that the chairman of a meeting can do a great deal to protect the audience against these enemies—and he proposes that the chairman be given a new title: "Sole Protector of the Audience."

Speakers themselves can do much to perfect their technic of delivery by



pondering this list of audience enemies long before they mount the platform.

#### MAGAZINE ARTICLES

Recent popular magazine articles on health or of medical import:

"What Medical Specialists Do." (A chart compiled by medical authorities.) *Good Housekeeping Magazine*, April, 1942.

"Do You Want to Be a Nurse?" Dorothy Dunbar Bromley. *Good Housekeeping Magazine*, March, 1942.

"Women Without Men." Maxine Davis. *Good Housekeeping Magazine*, March, 1942.

"Health for Young America." Thomas Parran, M.D. *Parent's Magazine*, March, 1942.

"Headaches Are a Luxury." Helen Furnas. *Coronet Magazine*, March, 1942.

"How to Dodge a Cold—or Lick One." Lois Mattox Miller. *Better Homes and Gardens*, March, 1942.

"A Dozen Don'ts That Save Lives." Charles B. Scully. *Better Homes and Gardens*, March, 1942.

"Do You Really Know What to Eat?" Paul de Kruif. *The Reader's Digest*, April, 1942.

"Germ Killers from the Earth: The Story of Gramicidin." John Pfeiffer. *Harper's Magazine*, March, 1942.

"The Fight Against T. B." Louise Fox Connell. *You Magazine* (Spring issue), 1942.

"Advice to Pregnant Husbands." Eileen Wilson. *Coronet Magazine*, April, 1942.

(The above is not presented as a complete list and the articles cited are not necessarily recommended.)

#### FOR SAFER HOMES AND FARMS

The National Safety Council recently held a special conference in Chicago on farm and home safety. The meeting was called in recognition of the increas-

ing gravity of accidents in these fields generally, and also because of the importance of home and farm accident prevention in the present national war emergency.

Of special interest to workers in the public health field was the recognition, at this conference, of the part that can and should be played by health departments, nursing agencies, and similar professional health groups in studying home accident factors, and in exercising preventive measures. Reports were presented indicating the importance of nursing contacts in the home and the use of personal hygiene educational technics, as developed by health departments, in the control of home hazards.

It is also significant to note that the American Public Health Association, the New York State Department of Health, and other health agencies were officially represented at this conference. Plans were perfected for an emergency program, aimed at accident control, especially for smaller communities and rural areas where full-fledged safety movements with paid executives are not practicable. The National Safety Council recognized its responsibility in enlisting the coöperation and aid of numerous agencies able to contribute to the solution of this problem, including the Boy Scouts, the Girl Scouts, the Red Cross, Chambers of Commerce, Departments of Agriculture, and the like. To an increasing extent it may be expected that health agencies, official and voluntary, will be called upon to participate more actively in education as to home and farm safety.

In fact, the New York State Department of Health has already taken initial steps toward the development of an educational program to combat such accidents. At a recent conference held in Albany, representatives of practically all official and voluntary agencies of the state concerned with accidents, agreed that a program should be worked out.

Public health nurses are to play an important part in the proposed educational campaign.

#### JOTTINGS

The *New York Times* recently commented on the growing tendency of factory managers to distribute vitamin pills to workers. The paper, after deploring "the vitamin craze" in general, remarked that "the nutrition expert should determine when vitamins are to be administered—not a well-meaning, but uninformed, factory manager." . . . Watch for the appearance of "Vital Victor," a cartoon character that may become the symbol of good nutrition. His body is constructed of various food products. He is a rather ingenious little fellow and will probably catch the public's fancy. . . . A quotation from *The Lancet*, the British medical journal: "Two sorts of scientists speak from public platforms: those who think they have something to say and those who think they have to say something." . . . If optimum health and cleanliness go hand in hand, then there's comfort in knowing that last year the 76 members of the Association of Soap Producers, representing about 40 per cent of the nation's production, had sales amounting to \$326,133,270! . . . It is predicted that as cuffs disappear from men's trousers, the number of injuries due to falls will sharply decline. In the thirty-odd years that cuffs have been fashionable they accounted, it is believed, for 93 per cent of all male falls downstairs, including 52 per cent for which Demon Rum got the blame. . . . Two recent books that are all well worth reading: (1) *The Men Who Make the Future*, by Bruce Bliven, and (2) *Science Year Book of 1942*, by J. D. Ratcliff. Mr. Bliven's book is an engrossing account of the amazing scientific discoveries that are now taking place in medicine, surgery, chemistry, and other fields. Mr. Ratcliff's book is a straightforward

summary of scientific advances in the past year, written in the author's usual lively style. . . . Do you enjoy a literary adventure now and then? If so, read "Soliloquy to Balance the Budget," a radio play by Norman Corwin. We recommend it here particularly because of Corwin's masterful description of the human brain and its functions. The play is found in a collection of radio dramas published by Henry Holt and Company under the title "Thirteen by Corwin." . . . If there are any readers of this section of the JOURNAL who have not yet seen the "Fitness for Freedom" issue of *Survey Graphic* (published in March), we suggest securing a copy. This excellent number was planned "to spread the gospel of health" and no public health worker should miss it. Much of the material in this special issue could be used advantageously in preparing speeches for the general public. . . . One of the country's leading poster artists says: "The poster field is a very special one and involves difficulties and problems unlike those encountered in other art forms. So much depends on terseness and absolute clearness. Ideas must be instantly communicated or they are likely not to get across at all. The poster must be designed to be read by him who runs. Thus it becomes a matter of presenting a single idea with such arresting forcefulness that a mere swift glance on the part of the spectator suffices. When a poster fulfils these requisites, it rings the bell." . . . Quotation from Grace T. Hallock: "The final stages of a campaign against a disease are always the hardest because enthusiasm wanes when a cause is almost won. If we forget what an ebbing menace was like when it was at the flood, we may neglect the precautions which will keep it from rising once again. Perhaps that is one of the chief services of history—to keep a memory green until a task is done."

## BOOKS AND REPORTS

**Handbook for Civilian Defense—**  
By H. Mayer-Daxlanden. New York:  
*Civilian Advisory Service* (41 Park  
Row), 1941. 88 pp. Price, \$1.00.

In a preface the author of this timely handbook tells us he came to its writing "consumed with apprehension" after studying civil defense in Europe and nearly 20 years of publishing on industrial hygiene and accident prevention. His handbook is an elementary one, almost devoid of technical language and designed in good spirit to assist the novice who volunteers as a civilian defense worker in these days of potential blitz warfare on the home front.

Almost at once the text jumps into the matter of incendiary bombs and fire control, and from there rather abruptly to the air raid warden service, and thence in a series of loosely connected paragraphs it covers about all of the recognized civil defense activities, or, as the British would have it, Air Raid Precautions (ARP) services. Nearly 20 of the 88 pages are devoted to chemical or gas warfare from the civilian viewpoint, and who can tell whether this is too great emphasis? In the air raid warden portion we find an essential doctrine set forth that is gradually gaining adequate acceptance in the United States, namely that *all* civil defense personnel should have theoretical training, followed by practical drilling in the field in order to establish familiarity with vital duties through practice. "Each service must have its own detailed instruction but an air raid warden must understand the basic principles of all the work."

Air raid warnings, control and report centers, shelters, first aid posts and medical services, rest and feeding and

nutritional branches of civil defense, and a host of allied welfare responsibilities—these fill the short and longer paragraphs in a rather disjointed manner in the handbook which at first disappoints by its lack of order and balance in the discussion of the various topics. In the end, however, the reading has been stimulating and should lead to a desire to know thoroughly the first text in the bibliography, that best American reference *Civil Air Defense*, by A. M. Prentiss, Lt. Colonel, U. S. Army. In this connection, mention should perhaps be made of the more recent publications of the U. S. Office of Civilian Defense, the *Handbooks*, *Textbooks*, *Planning and Training Guides*, and *Bulletins* which can be secured by the interested civilian through his local defense council, and of the British Library of Information, 30 Rockefeller Plaza, New York, N. Y., which is the American source for all official British publications including ARP and the related Emergency Medical Services. And, finally, no one should miss John Strachey's classic eye and ear-witness description of the London blitzes he went through as a warden, entitled "Digging for Mrs. Miller." HUNTINGTON WILLIAMS

**Behind the Mask of Medicine—**  
By Miles Atkinson. New York:  
*Scribner*, 1941. 348 pp. Price, \$3.00.

This is not just another book. The author says that it is not easy to explain in a few words the idea he had in writing it, but that it "represents an attempt to find out where and how we have gone wrong." He believes that we have gone wrong in more ways than one.

The twelve chapters are systemati-

cally arranged, and contain a wealth of information, much of which is intended for the public, but all of which should be better known to the medical profession than is the case. He glories in the achievements of the medical profession but does not hesitate to point out its weaknesses. He emphasizes the social side of medicine and declares that it is not only a social science, but "perhaps the most important of them all." He follows the historical method, believing that a study of the past provides our only safe guide for the future.

The phenomenal progress made during the last hundred years has come like "a thunderbolt of knowledge which knocked away the props that had stood for two thousand years and more." We have not had time to digest what has come to us, and medicine, like the rest of the world, is in something of a turmoil. The author emphasizes reverence for the profession, its accomplishments, standards, and aims, holding that without the knowledge we owe to medical science we would revert inevitably to the darkness of the Middle Ages. As a basis for this belief the first two chapters are devoted to history and are well done. Later chapters speak of the problems which the doctor is constantly up against, beginning with diagnosis. As presented, they constitute really a study of human nature as the doctor sees it in practice. This necessarily brings in the fads and follies, for some of which the doctor is responsible, such as too much specialism, excesses in surgery, quacks, fee-splitting, etc.

The discussion of euthanasia which comes in the chapter "The Art of Prophecy" (prognosis) is one of the best. The chapter, "Tradition in Medicine" is striking. As a graduate of "Barts," the only hospital remaining within the boundaries of the old city walls of London, the author naturally turns to the tradition of that hospital

as an outstanding example, and says that no member of the staff ever violates it and puts private practice before the hospital. He says, "It is in my blood. That is the way with tradition."

The author deplures most of the trends of modern medicine, attributing them to the machine age, which though producing better end results, has done great damage to the physician. He insists that nothing can take the place of the old physician, the personal diagnosis arrived at by careful observation, and the comfort given the patient, even when the outlook is the worst. One can often tell as much with a trained finger—"tactus eruditus" of the old school—as with an electric gadget. To illustrate this point, he tells the story of Sir James McKenzie, who as a busy general practitioner among poor patients and with the simplest of equipment, founded modern cardiology. To his dying day he maintained the advantage of clinical methods over the machine.

The book ends with a forecast which is pessimistic, though the author denies it, and calls himself an optimist. While he believes that our present civilization ended in June, 1940, with the "fall of France and the end of the amazing century," he holds that even if our present civilization dies it has left a record of great strides in the 600 years of its life, and will hand to the next civilization "a tradition of scholarship worthy of that which Greece and Rome bequeathed to it. . . . Medicine may even prove to be the link that will join the old age to the new."

A historical error is found on page 28, where the discovery of the agency of the mosquito in the transmission of yellow fever is attributed to General Gorgas instead of to Walter Reed. General Gorgas was not connected with the Commission, directly or indirectly, and in fact was very slow to accept its findings.

It is hard to speak too highly of this book. Unquestionably there will be disagreement with some of the statements made and grounds taken, but on the whole the author inculcates the highest standards of conduct under every circumstance which may confront the doctor either as a physician or man. We hope for the book a wide reading, not only among the laity but among doctors, especially those entering practice. MAZŸCK P. RAVENEL

**Modern Sanitary Engineering—**  
*By G. Eric Mitchell. Brooklyn, N. Y.: Chemical Publishing Co., 1942. 166 pp., diagrams, tables. Price, \$5.00.*

A presentation of current British practice in the drainage and sanitation, ventilating, and heating of buildings from foundation to completion, and water supply. Although of use to municipal surveyors and architects, the entire field of sanitary engineering as usually treated in American books is not covered. Plumbing is discussed at some length as are British by-laws with respect to water supply.

ARTHUR P. MILLER

**The Essentials of Occupational Diseases—**  
*By Jewett V. Reed and A. K. Harcourt. Indianapolis: Thomas, 1941. 225 pp. Price, \$3.00.*

The necessity for the maintenance of man power in the present war emergency makes a volume on the subject of the occupational diseases very timely. In fact, the American literature has been sorely deficient in this respect for many years.

The present volume is very logically arranged and includes sections on poisons, physical agents, skin lesions, pulmonary occupational diseases, occupational malignant diseases, occupational infection, and functional disturbances associated with occupation. Judged by the table of contents, the present volume must be considered

very satisfactory. It is, however, a small book, 225 pages in all, including the bibliography and index, and because of the large field which it covers the presentation of each individual subject is exceedingly brief. For example, 79 chemical poisons are discussed in 100 text pages. It is easy to see that each individual poison must of necessity receive very scant treatment, so scant, in fact, that the volume must be considered as having a very limited field of usefulness. This same criticism is valid throughout the whole of the volume. The prevention of the occupational diseases receives no consideration.

The volume closes with a satisfactory pertinent bibliography of 15 pages.

LEONARD GREENBURG

**Treatment of the Patient Past Fifty—**  
*By Ernst P. Boas, M.D. Chicago: Year Book Publishers, 1941. 324 pp. Price, \$4.00.*

The author discusses those diseases (mostly chronic and mostly those of the cardiovascular-renal system) which predominate in elderly people, giving sound observations based upon his own extensive clinical experience. He furthermore elaborates, wherever possible, upon the different clinical picture or the different treatment needed with elderly patients as contrasted with younger patients suffering from the same diseases. In this he is limited by the inadequacy of our present information on aging rather than by any unfamiliarity with the literature. A chapter is given to the "general management of the aging and aged person." Dr. Boas distinguishes between aging and pathological processes but seems to assume that only the latter offer hope of control.

The book is for the practising physician. It points out that "the physician tends to minimize the importance of a routine health examination." A chapter is then given to general diagnosis and

treatment of the aged. It is not intended as a textbook or as a reference book. Instead it is both a clinical discussion of chronic diseases and an exposition on the treatment of elderly patients. It admirably fulfils its purpose.

HENRY S. SIMMS

**Health—Safety—Growth Series:**

*Gaining Health (Grade V)*—By C. E. Turner, Juanita McD. Melchior and Grace Voris Curl. Boston: Heath, 1941. 296 pp. Price, \$.76.

*Cleanliness and Health Protection (Grade VI)*—By C. E. Turner, Juanita McD. Melchior and Grace Voris Curl. Boston: Heath, 1941. 244 pp. Price, \$.76.

*Working for Community Health (Grade VII)*—By C. E. Turner, C. E. Burton and Grace Voris Curl. Boston: Heath, 1941. 276 pp. Price, \$.84.

*Building Healthy Bodies (Grade VIII)*—By C. E. Turner and C. E. Burton. Boston: Heath, 1941. 308 pp. Price, \$.88.

Any health worker wishing to stimulate school administrators to a new interest in health teaching in the schools, or any school man desiring to show health officers or supervising nurses what modern educational practice is offering in the classroom, should investigate this series which has a book for each grade from the 5th through junior high school.

Health educators disagree as to the emphasis to be placed on presenting anatomical and physiological facts. This reviewer believes Turner and his collaborators have struck the happy mean. The functioning of knowledge at home, in school and in the community is stressed. And the facts are expressed in vocabulary which does not belong to the physiologist or doctor but to the child's own age level. Over and over stress is placed on how to make the best use of everything you have in order to get what *you* as an individual want

out of life. The story telling technic is not overdone. It is so extremely well done in fact that in the last of the series one wishes for more.

The high points of this series are: (1) Each book has a fresh approach adapted to the grade level; (2) the organization of the materials makes them adaptable to various teaching methods; (3) the books are rich in objective material for testing knowledge and behavior, as well as giving an opportunity for original work; (4) the classroom background within which the series was developed has contributed a simplicity of approach that is often lacking in other readers; (5) the standards of accuracy are high; and (6) the carefully prepared word-list for vocabulary building in each book is a fine teaching device.

Among the excellent series of health readers made available during the past year this set is further distinguished for successfully attaining that difficult quality of talking directly to children instead of *about* them. They are friendly books and pupils will like them.

DOROTHY B. NYSWANDER

**The Baker Memorial, 1930-1939—**  
*By Haven Emerson, M.D. New York: Commonwealth Fund, 1941. 75 pp. Price, \$.50.*

After many years of preliminary discussion and planning the Baker Memorial, "dedicated to the care of people of limited means," admitted its first patients in March, 1930. It was made possible by gifts amounting to \$1,900,000 plus contributions by the Julius Rosenwald Fund and the Baker Memorial, parent institution, the Massachusetts General Hospital, to meet operating deficits which during the first 9 years and 10 months of operation amounted to \$387,150.60. This was exclusive of depreciation and interest. The years 1938 and 1939 each showed a small operating surplus. The average

daily census of patients increased from 87 in 1930 to 208 in 1939 and the percentage of beds occupied, from 54 per cent in the former year to 86 per cent in the latter.

The average Baker Memorial patient had an annual personal income between \$2,000 and \$2,500; he remained in the hospital 13.4 days; he paid \$66.06 for professional services, and for hospitalization expenses, \$119.09. Thus his hospital experience cost him about 8.5 per cent of his annual income. In 1939 the 300 doctors who had patients under their care in the Baker Memorial received from them an average of \$1,290 in professional fees, all of which are collected by the hospital in behalf of the doctors.

That the Baker Memorial has won the approval of that segment of the population it was intended to serve seems clear from its steady growth, from its increasingly satisfactory financial experience, and from the testimony of its patients. Ten questions were sent to 1,766 patients; 943 replied; with only unimportant exceptions the patients who replied were well satisfied with their hospital experience.

The support and approval of the physicians of the Boston area, both those on the closed staff and those without the privilege of taking care of their patients in the hospital, seems to have been nearly unanimous. A minority of the staff were dissatisfied with the inclusive medical fee of \$150; this provision was accordingly somewhat relaxed after 1938 in instances in which patients remained in the hospital more than 3 months.

The theories, policies, and practices of the Baker Memorial provide much helpful material for other communities considering an attempt to provide adequate medical care for the economic group between ward patients and private patients. But it is not irrelevant to point out that the Baker Memorial

was founded under circumstances hard to duplicate. It has had generous financial backing; its parent hospital is one of the great institutions of clinical investigation and teaching; many of the professional staff are distinguished leaders in their fields of work, their professional standards are high, and many have reputations which inevitably would draw patients to the hospital.

In this interesting report Dr. Emerson has made available data accumulated during the first 10 years of the Baker Memorial experience. His approach has been quantitative and his emphasis, like that of nearly every one who writes on problems of medical care, has been on the economic and administrative problems. In these areas his analysis is clear and comprehensive. One could wish that he had extended his analysis to the quality of medical care at the Baker Memorial. A study of the care and completeness with which the patients' records are kept; the percentage of autopsies; the attendance at autopsies; the discrimination with which the laboratory facilities are used; the promptness with which diagnostic and therapeutic discoveries of proven value are adopted; and other similar criteria of quality would have been of great interest. Also an analysis of the Baker Memorial as an educational influence might fittingly have been included. Information on such aspects of a hospital's social responsibilities as staff meetings, educational opportunities for interns and residents, pathological conferences, library facilities, and, not least in importance, the educational influence on the physicians of the Boston area who refer patients to the hospital but are not on the staff, would have been appropriate. G. M. MACKENZIE

*How to Prevent Goiter—By Israel Bram. New York: Dutton, 1941. 182 pp., 21 ills. Price, \$2.00.*

This small volume is divided into 17

short chapters. The author states that the book is for the purpose of enlightening the public on diseases of the thyroid. The two principal disease groups (1) simple goiter and (2) exophthalmic goiter, are conservatively discussed, and no attempt is made to confuse the reader by reviewing the many other associations of goiter, which the author could have done by stating that goiter is a symptom rather than a disease.

The headings of some of the chapters, as for example "The Healthy Thyroid," "The Unhealthy Thyroid,"

and "What and When Is a Goiter?" may make these chapters more salable but one wonders whether such conservative chapter headings as "Normal Thyroid," "Abnormal Thyroid," and "What Is Goiter?" would not have had just as much appeal with less of the tabloid features of journalism.

The desirability and even purpose of such books may be questioned. Not enough is known by experts in this field to present any comprehensive and simple picture for laymen and, as always, a little knowledge may be a dangerous thing. DAVID MARINE

## BOOKS RECEIVED

- MODERN MEDICINE. ITS PROGRESS AND OPPORTUNITIES. By Netta W. Wilson and S. A. Weisman. New York: Stewart, 1942. 218 pp. Price, \$2.00.
- DOCTORS ANONYMOUS. THE STORY OF LABORATORY MEDICINE. By William McKee German. New York: Duell, Sloan & Pearce, 1941. 300 pp. Price, \$2.75.
- DENTAL EDUCATION IN THE UNITED STATES. By John T. O'Rourke and Leroy M. S. Miner. Philadelphia: Saunders, 1941. 367 pp. Price, \$5.00.
- TIME AND THE PHYSICIAN. The Autobiography of Lewellys F. Barker. New York: Putman, 1942. 350 pp. Price, \$3.50.
- BIOLOGY FOR BETTER LIVING. By Ernest E. Bayles and R. Will Burnett. New York: Silver Burdett, 1941. 754 pp. Price, \$2.28.
- FOOD VALUES IN SHARES AND WEIGHTS. By Clara Mae Taylor. New York: Macmillan, 1942. 92 pp. Price, \$1.50.
- MINERALS IN NUTRITION POPULARLY EXPLAINED. By Z. T. Wirtschafter. New York: Reinhold, 1942. 175 pp. Price, \$1.75.
- FOOD AND DRUG REGULATION. By Stephen Wilson. Washington: American Council on Foreign Affairs. 177 pp. Price, Cloth, \$3.25; Paper, \$2.50.
- FIRST AID PRIMER. By Hermann Leslie Wenger and Eleanor Sense. New York: Barrows, 1942. 104 pp. Price, \$1.00.
- NURSING IN DISEASES OF THE EYE, EAR, NOSE AND THROAT AS PRACTICED AT THE MANHATTAN EYE, EAR AND NOSE HOSPITAL. 7th edition. Philadelphia: Saunders, 1942. 313 pp. Price, \$2.50.
- RABIES. By Leslie T. Webster. New York: Macmillan, 1942. 168 pp. Price, \$1.75.
- LANE MEDICAL LECTURES: THE LYMPHATIC SYSTEM. Its Part in Regulating Composition and Volume of Tissue Fluid. By Cecil K. Drinker. Stanford University: Stanford University Press, 1942. 235 pp. Price, \$2.25.
- GUIDES TO SEX HORMONE THERAPY. Prepared and Published by the Schering Medical Research Division, Schering Corporation, Bloomfield, N. J., 1942. Three volumes.
- A PRIMER ON THE PREVENTION OF DEFORMITY IN CHILDHOOD. By Richard Beverly Raney and Alfred Rives Shands. Elyria: National Society for Crippled Children of the United States of America, 1941. 188 pp. Price, \$1.00.
- PROCEEDINGS AND PAPERS OF THE TWELFTH ANNUAL CONFERENCE OF THE CALIFORNIA MOSQUITO CONTROL ASSOCIATION. Held at Agriculture Hall, University of California, Monday, December 15 and Tuesday, December 16, 1941. Price, \$1.00.



## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**Something New Under the Sun—**A census of the sewerage systems and disposal methods in the several states. The report shows very substantial progress in the treatment of community sewage. In five states the percentage of the population now served approaches 90. Raw sewage however is still a first class sanitary hazard in many, many sections of the country.

ANON. A Summary of Census Data on Sewerage Systems in the United States. Pub. Health Rep. 57, 12:409 (Mar. 20), 1942.

**A Word to Wise Child Hygienists—**As tonsillectomy may be done at any time of year, it appears inadvisable to have this operation performed during the poliomyelitis season. Avoiding tonsillectomies then would probably eliminate many cases of the grave and highly fatal bulbar form.

ANON. Tonsillectomy and Poliomyelitis. J.A.M.A. 118, 12:980 (Mar. 21), 1942.

**Odd Items from Everywhere Department—**National rose hip tea is now on sale (in England), one teaspoonful being sufficient to supply the daily vitamin C need of a child. Plans are under way for the collection of another 200 tons of rose hips on a nationwide scale by teachers, children, *et al.* to be converted into syrup, by selected firms, for use by young children.

ANON. Editorial Notes. J. Roy. Inst. Pub. Health & Hyg. 5, 2:27 (Feb.), 1942.

**Ammunition for Health Educators—**Nutritionists especially will be interested in these two papers, one reporting upon experimental animals, the other on patients. Together they leave

no doubt but that a vitamin C deficiency decreases the tensile strength of healing wounds. Normal healing may be produced by adequate vitamin C intake postoperatively.

BARTLETT, M. K., *et al.* Vitamin C and Wound Healing. New Eng. J. Med. 226, 12:469 (Mar. 19), 1942.

**Reemployment of the Tuberculous—**Though there is no evidence that contact with the tuberculous can reactivate quiescent lesions in an employee, the compensation commission's hypothesis that such exposure does reactivate old lesions (therefore tuberculosis in an ex-patient employee is compensable) has caused hospitals to discontinue the employment of ex-patients. This is hurtful both to the institutions and the rehabilitated ex-patients.

BRAHDY, L. Arrested Tuberculosis and Hospital Employment. J. Indust. Hyg. & Toxicol. 24, 3:53 (Mar.), 1942.

**Effective Lay Participation—**With professional guidance, lay groups can (1) stimulate adequate health services, (2) support competent officials, (3) obtain appropriations, (4) develop widespread understanding of administrative projects, (5) carry on health educational programs. Ways by which they can be organized and guided is the meat of this excellent paper.

BUCK, C. E. The Citizen's Role in Public Health. Pub. Health Nurs. 34, 3:129 (Mar.), 1942.

**Premarital Tests—**Through the six years of their enactment, some weird premarital legislation has been written

upon the law books, and the 1941 crop succeeded in adding confusion to the existing diversity of procedures. A uniform law, and reciprocity, would add to the undoubted value of this legislation.

FORSTER, G. F., and SHAUGHNESSY, H. J. Premarital Examination Laws in the United States. *J.A.M.A.* 118, 10:790 (Mar. 7), 1942.

**Serious Answer to Nutritional Doubts**—Evidence presented here that dietary inadequacies and malnutrition are of frequent occurrence in these United States, and that the nutritional status of an appreciable part of the population can be improved, should be studied by any health worker who may have been impressed by the repeated insistence of one of our widely read medical publicists that malnutrition is seldom seen in the celebrated clinics of the country.

JOLLIFFE, N., *et al.* The Prevalence of Malnutrition. *J.A.M.A.* 118, 12:944 (Mar. 21), 1942.

**All about Soap**—An answer to almost any question one might raise about soaps and the newer sulfonated detergent products will be found in this extensive review of the subject. Sanitarians will be particularly interested in the discussion which leads to the conclusion that mechanical removal of pathogenic organisms from the skin by the emulsification of resident insoluble oils, plays a greater rôle in "sterilization" through scrubbing, than by the actual germicidal action of the detergent used.

LANE, C. G., and BLANK, I. H. Cutaneous Detergents. *J.A.M.A.* 118, 10:804 (Mar. 7), 1942.

**Flea- vs. Louse-borne Typhus**—Evidence is presented to show that in China, as in Mexico, flea-borne typhus may exist alongside the louse-borne disease, and that epidemics may originate from sick rats. Whether all modern

epidemics spring from rodent reservoirs cannot yet be answered.

LIU, W. T., *et al.* Typhus Fever in Peiping. *Am. J. Hyg.* 35, 2:231 (Mar.), 1942.

**Public Health Takes on a New Urgency**—Here is a brief summary of the Public Health Service's increasing wartime activities in caring for an augmented merchant marine, an ever-expanding industrial population, civilian health problems in war industry areas, and the vicinity of cantonments. This is a total war, we need often to be reminded.

PARRAN, T. Wartime Problems of the Public Health Service. *J.A.M.A.* 118, 13:1033 (Mar. 28), 1942.

**Immunology of Viruses**—There is reason to believe that in those virus diseases which confer lasting immunity, the virus establishes itself permanently in, and lives happily with, the body cell. In those diseases like the common cold, the superficial cells carrying the virus are thrown off to be replaced by new, and unaffected cells, and immunity is thus made temporary indeed.

RIVERS, T. M. Immunity in Virus Infections. *Science* 95, 2457:107 (Jan. 30), 1942.

**Apparent Failure for Influenza Vaccine**—Your attention was called in an earlier bibliography to the introductory part of an exhaustive study upon influenza immunization. The last chapter is now published, and with it the conclusion that as employed in these studies, influenza virus vaccines failed to reduce the incidence of illnesses related to influenza A or any acute respiratory diseases.

SIEGEL, M., *et al.* A Study in Active Immunization against Epidemic Influenza and Pneumococcus Pneumonia at Letchworth Village. *Am. J. Hyg.* 35, 2:186 (Mar.), 1942.

**After the Fury Subsides**—Do you remember all the dire forebodings

raised by the viewers-with-alarm when premarital blood tests were proposed? Well, after 6 years of experience, the first state to impose this dreadful incentive to immorality on its helpless population finds that marriages have increased, that illicit sex relations have not been encouraged, and that, instead, the law has proved an important method of discovering syphilis, a protection to the innocent, a means of encouraging adequate treatment, a potent preventive of congenital syphilis, and a law of enormous educational value.

TALBOT, H. P. Six Years of the Premarital Blood Test Law in Connecticut. *Monthly Health Bull. (Connecticut)* 56, 3:62 (Mar.), 1942.

More about Cancer in the South—In Birmingham nearly half the white male cases were skin cancer, a proportion higher than in any other city in

the series reported upon. Of the white female cases a third were genitourinary, a quarter were skin, and a fifth were breast cancer cases. There is much else in the report of interest to all health workers.

SOMMERS, H. J. The Incidence of Cancer in Birmingham and Jefferson County, Alabama, 1938. *Pub. Health Rep.* 57, 11:377 (Mar. 13), 1942.

For Your Housing Problem—Are you interested in employing a yardstick for the measuring of housing conditions to guide inspection and enforcement programs? Here, then, is an item upon the technic which might be employed by a local agency on a sampling basis or for a whole substandard area.

TWICHELL, A. A., and SOLOW, A. An Appraisal Technique for Urban Problem Areas as a Basis for Housing Policy of Local Governments. *Pub. Health Rep.* 57, 9:285 (Feb. 27), 1942.

#### CORRECTION

Correction for page 154, paragraph 1, last sentence, *American Public Health Association Year Book, 1941-1942*

Substitute the following:

In view of the difficulties in classifying

hemolytic streptococci according to serologic type, it was recommended, by implication, that typing not be included in routine practice until the procedures have been perfected.

## ASSOCIATION NEWS

SEVENTY-FIRST ANNUAL MEETING  
ST. LOUIS, MO., OCTOBER 27-30, 1942

*Headquarters*  
MUNICIPAL AUDITORIUM

### APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

#### *Health Officers Section*

Herbert K. Abrams, M.D., Miller County Health Dept., Texarkana, Ark. Director  
Harold W. Beaty, M.D., Health Officer, Wells, N. Y.  
Evan C. Bourdon, M.D., 222 W. Mesquite, Uvalde, Tex., Director, Tri-County Health Unit  
Paul W. Bowden, M.D., M.P.H., Dept. Public Health, City Hall Annex, Richmond, Va., Epidemiologist.  
Willis W. Bradstreet, M.D., 4242 Culver Rd., Point Pleasant, N. Y., Health Officer  
Paul J. Bundy, M.D., Grundy, Va., Buchanan Co. Health Officer  
Edward J. Carroll, A.B., Town Office Bldg., Hingham, Mass., Health Officer  
Merle E. Cosand, M.D., Isolation Hospital, Peru, Ill., District Health Supt.  
L. Edward Cotter, M.D., North Broadway, Red Hook, N. Y., Health Officer, Red Hook Consolidated Health Dist.  
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Reuben Mutnick, M.D., 459 N. Sycamore, Wahoo, Nebr., Medical Director, Dodge-Saunders Dist. Health Unit  
Herbert Notkin, M.D., Benton County Health Dept., Corvallis, Ore., Health Officer  
Howard E. Porter, Health Dept., Quincy, Mass., Agent  
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Disease Control, Bureau of Preventable  
Disease, State Health Dept.

### DECEASED MEMBERS

A. Elizabeth Bigelow, R.N., Meriden, Conn.,  
Elected Member 1935, Public Health Nurs-  
ing Section  
 Walter S. Frisbie, Washington, D. C., Elected  
Member 1925, Elected Fellow 1930, Food  
and Nutrition Section  
 C. Curtis Hudson, M.D., Greensboro, N. C.,  
Elected Member 1918, Elected Fellow 1922,  
Health Officers Section  
 Walter C. Klotz, M.D., New York, N. Y.,  
Elected Member 1920, Elected Fellow 1923,  
Epidemiology Section  
 Martha Tracy, M.D., Dr.P.H., Philadelphia,  
Pa., Elected Member 1940, Health Officers  
Section

## PROGRESS ON MERIT SYSTEM PROJECT

THE membership will be interested in knowing of the progress being made by the Committee on Merit Systems, a subcommittee of the Committee on Professional Education. It will be recalled that the Association was asked by the Children's Bureau and the U. S. Public Health Service to assist in the development of merit systems in the several states. Funds for the first year's work have been provided by several states.

With the able assistance of Milton Rose, M.D., formerly Professor of Public Health at the University of Pennsylvania, the committee has developed a file of examination questions as recently used, and studies have been carried out to discover the best ways of adapting modern methods of personnel selection to the public health field. Dr. Rose has now been called to the West Coast to serve with the American Red Cross. The committee has been fortunate in securing temporarily the services of Dorothy Deming, R.N., formerly Director of the National Organization for Public Health Nursing, who is serving as subject matter consultant in the field of public health nursing. As a specialist in test construction the services of Cecil Brolyer have been loaned temporarily by the Children's Bureau. Mr. Brolyer has had a long experience in the field of test construction with the Children's Bureau and the Social Security Board.

Among the needs felt by the several states, that for items in public health nursing is most urgent and the committee has therefore gone ahead on this phase of its work. Under the general direction of George H. Ramsey, M.D., Dr.P.H., Chairman of the subcommittee, a plan has been evolved to use twenty younger public health nurses for test construction. A series of 4 evening lectures on the rudiments of test con-

struction have been given these nurses, who have purposely been selected from among those in junior positions and among those actively engaged in field work in the belief that their knowledge of actual conditions will best fit them to act as subject matter consultants. At the conclusion of this course the nurses have begun the production of objective type test items which are then cleared through a group of senior public health nurses in positions of instruction or administration who act as members of a final jury. The questions, or items as they are called in this field, are then assembled in a reserve from which, on request, examinations will be constructed for the use of state merit system councils.

In a similar way it is expected that test construction can be carried out in other fields, using specialists from these fields as test constructors under the guidance of a qualified test technician. The resulting examinations it is expected will serve to appraise the abilities and knowledge of applicants as adequately as any tests can accomplish this purpose with our present knowledge.

## PUBLIC HEALTH NURSES

THE Merit System Committee of the American Public Health Association is experimenting with certain possible types of items for future use in examinations for public health nursing positions. The committee will have room 788 at the Palmer House, Chicago, during the Biennial Convention, May 18-22, and would appreciate having as many nurses as possible take these tests in order that some preliminary information may be obtained regarding the usefulness of these types of items. Nurses may take the tests anonymously and will be given their scores, but no interpretations can be attached to the scores.



APRIL MEETING OF THE COMMITTEE ON PROFESSIONAL  
EDUCATION

ALL the members of the Committee on Professional Education were present at the meeting on April 17 in New York with the exception of Dr. John E. Gordon who is in England. The committee unanimously adopted a Memorandum presented by Dr. W. P. Shepard of San Francisco, *Chairman*, regarding the Minimum Educational Facilities Necessary for the Postgraduate Education of Those Seeking Careers in Public Health, which is published in this issue. This Memorandum should be of immediate use to teaching institutions, appointing bodies, and candidates for professional careers in public health. It reflects the variety of educational resources which are essential for the proper training of persons in various specialties of public health. The committee hopes that it will serve to direct attention to excellent facilities that are available and make less likely the development of courses under auspices which, in the nature of the case cannot be regarded as adequate, even in the emergency.

George H. Ramsey, M.D., Chairman of the Subcommittee on Merit Systems, presented a report of current activities which is summarized on page 559.

The Committee on Professional Education adopted a simplified outline for handling future reports covering the training and experience of persons engaged in public health and approved a routine for handling these reports and maturing them into official declarations of the Association.

A preliminary report on the Educational Qualifications of Health Educators prepared by the subcommittee of which Clair E. Turner, Dr.P.H., is Chairman, was received by the committee. This report will replace the one on the Educational Qualifications of School Health Educators which was

previously approved by the Governing Council. The Executive Board will be asked to authorize the withdrawal of the earlier report from circulation, since it has already served its usefulness. Because of the demand for a statement on qualifications of health educators, the committee authorized the distribution of the new report in its preliminary form to interested individuals.

Ralph E. Tarbett, C.E., Chairman of the Subcommittee on the Educational Qualifications of Professional Personnel in Sanitation, reported that there was under way reconsideration of the subcommittee's report, having in mind the comments of the Conference of State Sanitary Engineers and others on the subject.

Other subcommittees having reports finally approved and published, presented statements which were considered. These dealt with the educational qualifications of health officers, public health nutritionists, industrial hygienists, public health statisticians, public health nurses, and public health nurses in industry.

New reports from subcommittees were received on the educational qualifications of laboratory personnel, maternal and child health specialists, professional workers in mental hygiene, specialists in cancer control, venereal disease control officers, and public health dentists.

For purposes of the committee's work, professional education has been defined for the time being to mean public health training at the graduate level, or that subsequent to basic or legally recognized professional training. The committee does not overlook the importance of sub-professional levels but recognizes that the problems of this group are so different from those of the professional worker that

they must be separately considered.

Interesting reports were received from Lowell J. Reed, Ph.D., representing the Association of Schools of Public Health, and from Harry S. Mustard, M.D., representing the Association of American Medical Colleges, in relationship to the teaching of public health. Consideration was also given to the budgetary provision being made for the emergency training of public health workers and supplemental funds available through various channels for physicians, dentists, public health nurses, and engineers, under the provisions of accelerated training.

It was decided to provide for a subcommittee on the educational qualifications of school physicians and for a subcommittee on qualifications for

secretaries of voluntary health agencies.

The members of the Committee on Professional Education present included William P. Shepard, M.D., *Chairman*, Reginald M. Atwater, M.D., *Secretary*, Edward S. Godfrey, Jr., M.D., Ira V. Hiscock, Sc.D., George H. Ramsey, M.D., Lowell J. Reed, Ph.D., Wilson G. Smillie, M.D., Ralph E. Tarbett, C.E., and Henry F. Vaughan, Dr.P.H. In addition, guests included John L. Rice, M.D., President of the Association, Huntington Williams, M.D., member of the Executive Board, Harry S. Mustard, M.D., Editor of the *Journal*, Mary J. Dunn, R.N., representing Pearl McIver, R.N., a member of the committee, Benjamin G. Horning, M.D., W. D. Stovall, M.D., and Clair E. Turner, Dr.P.H.

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## Health Conservation Contests' National Health Honor Roll

### WINNERS IN THE 13TH ANNUAL CITY HEALTH CONSERVATION CONTEST

Detroit, Mich.  
Evanston, Ill.  
Greenwich, Conn.  
Hackensack, N. J.  
Hartford, Conn.  
LaSalle, Peru, Oglesby, Ill.  
Louisville, Ky.  
Madison, Wis.  
Memphis, Tenn.  
Milwaukee, Wis.  
Newton, Mass.  
Racine, Wis.  
Reading, Pa.  
Schenectady, N. Y.

### WINNERS IN THE 8TH ANNUAL RURAL HEALTH CONSERVATION CONTEST

Alger-Schoolcraft Counties, Mich.  
Arlington County, Va.  
Davidson County, Tenn.  
Fayette County, Ky.  
Forsyth County, N. C.  
Gallatin County, Mont.  
Gibson County, Tenn.  
Glynn County, Ga.  
Lauderdale County, Miss.  
Madison County, Ky.  
Saginaw County, Mich.  
Santa Barbara County, Calif.  
Thurston County, Wash.  
Whitman County, Wash.

These Contests are conducted annually by the Chamber of Commerce of the United States with the coöperation of the American Public Health Association. The Rural Health Conservation Contest is financed by the W. K. Kellogg Foundation, and the City Health Conservation Contest is financed by the Metropolitan Life Insurance Company.

## EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York, N. Y.

### ARIZONA MERIT SYSTEM COUNCIL

The Merit System Council for the Arizona State Department of Social Security and Welfare and State Department of Health will probably shortly announce merit examinations for positions in those departments as follows:

State Director, Local Health Administration.....	\$350-400
Director Maternal and Child Hygiene.....	350-400
Director, Local Health Unit.....	350-400 and \$300-350
Health Officer-in-Training.....	300-350
Director of Sanitary Engineering.....	300-350
Sanitary Engineer .....	200-250
Director, Public Health Laboratory.....	300-350
Senior and Junior Bacteriologist-Serologist.....	165-215 and \$115-165 respectively
X-ray Technician .....	165-190
Director Public Health Nursing.....	215-265
Nursing Consultant, special fields.....	175-200
Supervising Public Health Nurse, local unit....	175-200
Senior and Junior Public Health Nurse, local unit	150-175 and \$125-150 respectively
Public Health Nurse-in-Training.....	100-125
Director Health Education.....	215-265
Nutrition Consultant .....	215-265
Vital Statistician .....	175-225
Medical Social Worker.....	165-190
Child Welfare Consultant.....	200-250

Competition is open on a nation-wide basis. Professional registration in Arizona required before appointment for certain classes. Closing date for receipt of applications will probably be about June 15.

Application blanks, information regarding qualification requirements, conditions governing filing of applications, and detailed descriptions of the various classes of positions may be secured from the Merit System Council, Room 208, Home Builders Building, Phoenix, Ariz.

### GEORGIA STATE MERIT SYSTEM ADMINISTRATION

The Supervisor of Examinations of the Georgia State Welfare Department announces competitive examinations for filling positions in the Public Assistance, Crippled Children, and Child Welfare Divisions. In the Crippled Children Division the salary ranges are minimum \$1,800, maximum \$2,280 for the position of Medical Social Worker, Orthopedic Field Nurse, and Physical Therapy Technician; for District Orthopedic Field Nurse a minimum of \$1,920, maximum of \$2,400; Physical Therapy Consultant a minimum of \$2,400, maximum of \$2,880; Orthopedic Nursing Consultant and Medical Social Consultant begin at a minimum of \$2,700 and range to a maximum of \$3,180; Medical Director of the Crippled Children Services begin at a minimum of \$4,200 with a maximum of \$5,400.

All of these positions are open to competitive assembled examinations except the Medical Director of the Crippled Children Services which is an unassembled examination. The examinations are based upon a rating of training and experience, a written test, and an oral interview. Each eligible who is appointed from the adequate register will be required to serve a probational period of 6 months as is the usual custom in Civil Service and Merit System agencies.

Georgia State residence is not required of an applicant in order to participate in the above examinations.

## U. S. CIVIL SERVICE COMMISSION

The Commission has announced unassembled examinations for Junior Public Health Nurse at \$1,800 a year and Junior Graduate Nurses at \$1,620 a year, under which the training and age requirements of announcements No. 88 and 103 of 1941 have been amended. Persons interested should communicate with the U. S. Civil Service Commission in Washington or obtain the amended announcements at any first or second class post office.

The Commission announces unassembled examinations for Home Economists in 5 different grades at \$2,600 to \$5,600 a year. Interested persons should apply to the Commission for *Circular 195* on Home Economics.

## PHYSICIANS NEEDED IN CANAL ZONE

The U. S. Civil Service Commission announces an examination to secure physicians for clinical service in the Panama Canal Zone. Graduation from a class A medical school subsequent to May 1, 1920, is required, and the applicant must be under 50, 25 to 35 years of age preferred. Entrance salary \$4,000. Persons interested should communicate with the U. S. Civil Service Commission, Washington.

## POSITIONS AVAILABLE

Physician with either public health training or experience in local health department administration to serve as health director in a county health department in mid-western state. Salary \$4,000 and \$500 travel (flat rate). Well established department with offices in attractive little city of 10,000. Write Box T, Employment Service, A.P.H.A.

Wanted: Trained Public Health Nurse, starting salary \$1,500 per year and traveling expense, increase to \$1,620 within 6 months. Saginaw County Health Dept., Saginaw, Mich.

Western state department of health will consider applications from physicians to fill four existing vacancies among county health officers, one vacancy in venereal disease control and positions as laboratory technicians. Write Box S, Employment Service, A.P.H.A.

County Public Health Nurses for New Mexico. Must have four months' post-graduate instruction under one of the recognized public health nursing courses and one year's experience. Must drive and have a car. Address inquiry to State Health Department, Santa Fe, N. M.

## PUBLIC HEALTH ENGINEER

Responsible professional public health engineering involving field investigations and office studies in the application of sanitary measures. The more difficult engineering and sanitation field surveys include supervision over public water supplies, sewerage systems and sewage treatment plants and review of plans for same, and promotion and supervision of sanitation programs. Minimum qualifications: Training and experience equivalent to 3 years' civil engineering experience, includ-

ing 2 years in public health or sanitary engineering; or completion of an academic year of graduate study and a year's experience in sanitary or public health engineering; and graduation from a college of recognized standing with a major course in civil or sanitary engineering. The salary range is \$205 to \$250 per month depending upon experience. Apply Box E, Employment Service, A.P.H.A.

## OTHER VACANCIES

Southwestern State Health Department seeks 2 physicians for assignment to district health units, personally to conduct several small venereal disease clinics on a rotating schedule. Experience preferred but not required. Salary \$3,000, plus actual travel allowance not to exceed \$1,200. Write Box V, Employment Service, A.P.H.A.

Middle western city, 125,000 population, seeks well trained and experienced Health Officer on full-time, with competence to administer a department and teach public health to medical students. Salary \$5,000 to \$5,500 per annum. Write Box K, Employment Service, A.P.H.A.

The New Mexico State Department of Public Health will consider applications for the position of Assistant Director of the Maternal and Child Health Division and for Dental Health Consultant of that Division; also for the position of Nutrition Consultant. Address inquiries to the State Department of Public Health, Santa Fe, N. M.

Wanted: Trained Public Health Nurse, starting salary \$1,500 per year and traveling expenses. Increase may be expected within 6 months. Shiawassee County Health Department, Corunna, Mich.

Wanted: Nurse for county health work. Salary \$1,800 per year with travel allowance (additional) of \$500 per year. Address District Health Department 2, West Branch, Mich.

Instructor in Bacteriology, Medical School, large midwestern university, M.D. (or Ph.D. or D.Sc. in Bacteriology); Male. Salary \$1,800 to \$2,500 according to age and experience. Write Box D, Employment Service, A.P.H.A.

## POSITIONS WANTED

### ADMINISTRATIVE

Teaching or administrative position desired by physician, aged 48. Experienced teacher in preventive medicine and public health, now employed at prominent medical school; 20 years' experience in municipal health administration and epidemiology. A-491

Physician, B.S., M.D., and M.S.P.H., University of Michigan, aged 35, experienced city-county health administration and as director university student health service. Will consider permanent responsible position offering good income. A-492

Physician, age 32, 5 years' clinical and administrative experience in venereal diseases, wishes administrative position in venereal disease control, preferably at state level. A-490

Physician, aged 28; M.D. Rush; M.P.H. Harvard; seeks administrative position under first class supervision. A-496

### WOMEN PHYSICIANS TRAINED IN PUBLIC HEALTH

Woman aged 34, M.D., University of Basle, Switzerland, M.S.P.H. DeLamar Institute, Columbia University. U. S. citizen. Excellent references. Especially interested in industrial hygiene. A-493

Woman aged 41, M.D. Columbia University, M.S.P.H. DeLamar Institute, experienced in epidemiology and research, seeks position offering administrative experience. A-494

Woman physician, aged 48, M.D., University of Vienna. Excellent European pediatric experience. Seeks position in pediatrics, administration or statistical research. A-495

### HEALTH EDUCATION

Teacher and research worker, man, Ph.D., age 52. Extensive record as college professor of biology and hygiene and investigator, for the past two years engaged in research. H-499

Health Educator, Negro, man with background of High School administration and M.S.P.H. from University of Michigan, seeks position in Health Edu-

cation. Public agency or educational field. Excellent references. H-497

Woman, M.S. in public health, excellent graduate training in education, 8 years' experience as business executive (sales and publicity). Just completed year's research in community education. Seeks good administrative position. H-496

Health Educator, M.A. in Education, 10 years' background in community organization for public health education, also teaching of personal and community health at high school and college levels. Public health nurse, able to teach mental and social hygiene as well as general health education. East preferred. H-498

Health Educator. Man with M.S. in preventive medicine and public health. Negro. Seeks position in Health Education or field work with official or non-official agency. H-500

Woman with master's degree in health education, 12 years' successful experience in public school and college teaching, administration and research. Will consider position in normal school, public schools, or in official or nonofficial health agencies. Prefers South or East. Available at once. H-501

### LABORATORY

Milk Sanitarian and Technologist, age 37, Ph.D., Bacteriology, Wisconsin, 10 years' experience in milk and food sanitation from industrial and official angle, seeks administrative position with opportunity for research or investigational work preferred. L-381

Chemist, Sc.D., Biochemistry, Johns Hopkins University. Age 31. Public health laboratory experience, teaching experience. Desires position with promise of advancement, preferably in commercial organization. L-461

Bacteriologist, young man 28, with B.S. in industrial science, experienced in newspaper work, salesmanship and now employed in state department of health laboratory, seeks position as bacteriologist or doing promotional work of public health nature. L-465

## STATISTICAL

Woman with academic, business and research experience in vital statistics, seeks a position in the vital statistics division of a state or city health department, preferably as registrar. S-459

Experienced and well trained public

health nurse, with background of tuberculosis, venereal disease, school, industrial, and generalized services, will shortly be available for appointment. Three years as director of state nursing service. Experienced as university teacher of public health nursing. M.A., New York University. M-449

## Advertisement

## Opportunities Available

**PUBLIC HEALTH NURSES**—(a) Director of nurses for hospital unit in western college; public health training and experience required; \$1,800-\$2,000. (b) Supervisor for Visiting Nurses Association, midwest city; two assistants; car furnished, all expenses; \$1,800. (c) Generalized service; responsibility for public health nursing in schools; \$1,800, liberal mileage allowance; Northwest. (d) Staff nurse for home delivery service; degree, public health certificate required; \$1,800, travel expenses. PH5-1, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

**PUBLIC HEALTH PHYSICIANS**—(a) Physician with public health administrative experience;

faculty appointment, university medical school; woman eligible; rank dependent upon qualifications. (b) Woman physician to head department of health, young women's college; South. (c) Pediatrician for interesting position, state public health department; \$4,800, traveling expenses; Midwest. (d) Public health physician; man or woman; if not trained, training provided; state department. (e) Student health physician; state university; opportunity to combine duties with training leading to M.C. in public health. (f) Woman physician to conduct lay educational program in cancer control; considerable traveling; Midwest. PH5-2, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

## Advertisement

## Situations Wanted

**YOUNG WOMAN PHYSICIAN**—Well trained in public health medicine and with successful record as county health officer desires position affording opportunity to specialize in syphilology in which, too, she has had some special training. PH5-3, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

**PUBLIC HEALTH ADMINISTRATOR**—Taught bacteriology and basic medical sciences for 5 years after receiving academic degree and before entering medical school; 12 years with a municipal health department during which time he served as director for 7 years; has made many valuable contributions

to professional literature; knows the scientific as well as practical side of public health medicine. PH5-4, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

**BACTERIOLOGIST**—Desires to re-locate; B.A., M.Sc., Ph.D. (in Bacteriology), eastern schools; 3 years, bacteriologist, state public health laboratories; past several years, instructor, department of bacteriology, state university; not likely to be called to military service. PH5-6, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

## NEWS FROM THE FIELD

## SUMMER SCHOOL COURSES IN PUBLIC HEALTH

*While the following list does not show all universities and technical schools offering summer courses in public health, it represents those which have replied to a questionnaire sent out by the American Public Health Association. Subjects covered may be ascertained by writing directly to the schools listed.*

- University of Alabama, University, Ala.*  
June 8–August 29
- Boston University, Boston, Mass.*  
July 6–August 15
- University of California, Berkeley, Calif.*  
June 29–August 7
- University of California at Los Angeles, Los Angeles, Calif.*  
June 29–August 7
- The Catholic University of America, Washington, D. C.*  
June 27–August 8
- University of Chicago (Department of Nursing Education), Chicago, Ill.*  
June 23–August 1; August 3–September 12
- Teachers College, Columbia University, New York, N. Y.*  
July 7–August 14
- Cornell University, Ithaca, N. Y.*  
June 29–August 8
- Duke University, Durham, N. C.*  
June 10–July 20
- Eastern Washington College of Education, Cheney, Wash.*  
June 18–July 17; July 20–August 19
- George Peabody College for Teachers, Nashville, Tenn.*  
June 8–August 21
- Harvard School of Public Health, Boston, Mass.*  
April 27–August 1
- University of Illinois, Urbana, Ill.*  
June 8–August 29
- State University of Iowa, Iowa City, Ia.*  
June 8–July 31
- Loyola University (School of Medicine), Chicago, Ill.*  
June 22–July 31
- Marquette University (College of Nursing), Milwaukee, Wis.*  
June 29–August 4
- Massachusetts Institute of Technology, Cambridge, Mass.*  
June 8–September 12
- Michigan State College, East Lansing, Mich.*  
June 23–July 31
- University of Michigan (School of Public Health), Ann Arbor, Mich.*  
June 15–August 8 and/or October 2; August 8 and/or October 2
- University of Minnesota, Minneapolis, Minn.*  
June 15–July 24; July 27–August 28
- National Society for the Prevention of Blindness, 1790 Broadway, New York, N. Y.*  
(in cooperation with the four following colleges and universities):
- Teachers College, Columbia University, New York, N. Y.*  
July 6–August 14
- George Peabody College for Teachers, Nashville, Tenn.*  
June 22–August 1
- State Teachers College, Buffalo, N. Y.*  
June 29–August 7
- Wayne University, Detroit, Mich.*  
June 29–August 7
- New Jersey State Teachers College at Montclair, Upper Montclair, N. J.*  
July 6–August 14
- University of New Mexico, Albuquerque, N. M.*  
June 8–August 1
- New York School of Social Work, 122 East 22nd Street, New York, N. Y.*  
July 20–July 31
- New York University (School of Education), Washington Square, New York, N. Y.*  
Interession, June 8–July 3; Summer Sessions, July 6–August 14
- University of North Carolina (School of Public Health), Chapel Hill, N. C.*  
June 11–July 21; July 22–August 28
- University of Oregon, Eugene, Ore.*  
June 13–July 17; July 18–August 21
- University of Pennsylvania (Department of Nursing Education), Philadelphia, Pa.*  
June 22–August 1

*University of Pittsburgh* (School of Nursing),  
Pittsburgh, Pa.

June 22-July 18

*Rutgers University*, New Brunswick, N. J.

June 29-August 9

*St. John's University*, Collegeville, Minn.

June 8-August 1

*Simmons College*, Boston, Mass.

June 29-August 7

*Stanford University*, Stanford University,  
Calif.

June 18-August 29

*Syracuse University* (Department of Public  
Health Nursing, College of Medicine),  
Syracuse, N. Y.

July 6-August 14

*University of Utah*, Salt Lake City, Utah.

June 15-July 23; Post Session, July 27-  
August 21

*Vassar College*, Poughkeepsie, N. Y.

June 22-August 1

*Medical College of Virginia*, Richmond, Va.

June 29—or any week or month following,  
to continue for 1, 2, or 3 months from  
time of registration

*Wagner Memorial Lutheran College*, Grymes  
Hill, Staten Island, N. Y.

June 8-July 18; July 27-September 5

*University of Washington*, Seattle, Wash.

June 23-August 21

*West Virginia University*, Morgantown, W. Va.

June 8-July 17

*College of William and Mary*, Williamsburg,  
Va.

June 15-September 12

*University of Wisconsin*, Madison, Wis.

June 29-August 7

#### CONFIDENTIAL REPORT ON BOMBING AVAILABLE

**W**ALTER D. BINGER, Chairman of the National Technological Civil Protection Committee, on his return from England as a consultant to the Secretary of War, has prepared a confidential report on his observations on many of the problems associated with the bombing of cities. In this report he discusses in considerable detail both the effects of such bombing and the administrative and technical practices which have been developed in England to prevent damage as well as to correct the effects of destruction.

The report is not available for general distribution, but a copy has been

placed in the office of the Commanding Officer of each Army Corps Area in the United States. It can be reviewed in that office, by permission of the Commanding Officer, upon request by public officials who have a concern with and are interested in the subjects covered. The report deals with a number of engineering and medical aspects of public health control under wartime conditions. It sheds considerable light upon the problems of maintaining utility service under these conditions of stress.

The American Public Health Association is represented on the National Technological Civil Protection Committee by Abel Wolman, Dr. Eng., Professor of Sanitary Engineering, Johns Hopkins University, and Chairman of the Executive Board, A.P.H.A.

#### NEW YORK STATE DEPARTMENT OF HEALTH PERSONNEL FOR MILITARY DUTY

**M**EMBERS of the Medical and Sanitary Engineering staffs of the New York State Department of Health called for military duty, with date of commencing such duty:

Daniel P. McMahon, M.D., District State Health Officer, February 26, 1942

Warren W. Lacey, M.D., Assistant District State Health Officer, April 1, 1941

Malcolm A. Bouton, M.D., Medical Consultant in Social Hygiene, April 13, 1942

Alfred H. Dobrak, M.D., Epidemiologist-in-training, June 1, 1941

Charles A. Agar, Senior Sanitary Engineer, April 1, 1942

Stanley T. Barker, Assistant Sanitary Engineer, November 11, 1940

Robert N. Clark, Assistant Sanitary Engineer, March 30, 1941

Andrew J. Fuller, Assistant Sanitary Engineer, December 30, 1940

Harly M. Riley, Assistant Sanitary Engineer, May 12, 1941

Ralph C. Sweeney, Assistant Sanitary Engineer, May 4, 1941

Lyndon M. Keller, Junior Sanitary Engineer, May 12, 1941

Nicholas Milone, Assistant Milk Sanitarian, April 6, 1942



## PUBLIC HEALTH SERVICE LOANS PERSONNEL TO NEW YORK STATE

THE New York State Department of Health announces that 3 physicians and 4 sanitary engineers of the staff of the U. S. Public Health Service Reserve have been loaned to the department for the purpose of providing additional service in regions where the population has been increased because of defense industry activities and military concentrations.

*Physicians*

Vernon B. Link, M.D.

Albert Rubin, M.D.

Joseph A. Walsh, M.D. (Assigned to duty with State Emergency Medical Service, Office of Civilian Defense)

*Sanitary Engineers*

Donald B. Stevens

Abraham H. Chasick

John S. Marvin

Daniel A. Okun

## TEN THOUSAND NURSES NEEDED FOR U. S. ARMY

ON March 13 it was announced that the U. S. Army Nurse Corps has immediate need for 3,000 qualified registered nurses and that, before the end of 1942, 10,000 in all will be needed to keep pace with the expanding demands from the Army. Eligible applicants must be of good character, unmarried, citizens of the United States, between 22 and 30 years of age, at least 5 ft. tall, and of standard weight for age and height. Graduation from an accredited high school giving a 4 year academic course and a school of nursing of approved standards is required, together with nursing registration. Applicants who can fulfil the requirements will be appointed to the grade of Nurse with the relative rank of Second Lieutenant. The pay is \$840 a year in addition to maintenance and uniform equipment. Appointment authority for the Army Nurse Corps is vested in the Commanding Generals of the various Corps areas.

## NORTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION

THE Northern California Public Health Association elected the following officers at its recent annual meeting in Berkeley:

*President*—John D. Fuller, M.D., Santa Cruz

*President-elect*—William A. Powell, M.D., Martinez

*Vice-President*—Edward A. Reinke, Berkeley

*Secretary*—Mrs. Ann W. Haynes, San Francisco

*Treasurer*—Helen Hartley, R.N., Stockton

*Representative to A.P.H.A. Governing Council*—Fred T. Foard, M.D., San Francisco

*Representative to Regional Board of Western Branch*—Edith P. Sappington, M.D., San Francisco

## SOUTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION

AT a recent annual meeting of the Southern California Public Health Association the following officers were elected to serve for the current year:

*President*—Roy O. Gilbert, M.D., Glendale

*President-elect*—A. Victor Nasatir, M.D., Los Angeles

*1st Vice-President*—Charles W. Arthur, Pasadena

*2nd Vice-President*—J. F. Kessel, Ph.D., Los Angeles

*Secretary-Treasurer*—Floyd P. Wilcox, D.V.M., Los Angeles

*Assistant Secretary-Treasurer*—Alice Rorri-son, Pasadena

## DELAWARE PUBLIC HEALTH ASSOCIATION ORGANIZED

AT a recent meeting in Wilmington, the Delaware Public Health Association was organized, with the following officers:

*President*—Edwin Cameron, M.D., Dover

*Vice-President*—George H. Gehrman, M.D., Wilmington

*Vice-President*—Anna Van W. Castle, R.N., Wilmington

*Secretary*—G. Taggart Evans, Wilmington

*Treasurer*—Roger Murray, M.D., Wilmington

PROCUREMENT AND ASSIGNMENT SERVICE  
ROUTINE FOR THE SELECTION  
OF MEDICAL PERSONNEL

LIEUTENANT COLONEL S. F. SEELEY, Executive Officer of the Procurement and Assignment Service for Physicians, Dentists, and Veterinarians, Washington, D. C., speaking recently in New York City before the Medical Society of the County of New York, described the questionnaires from the Procurement and Assignment Service which were circulated in April to all physicians, dentists, and veterinarians, giving them an opportunity to state their preference should they be called, whether in military, governmental, industrial, or civil activity. Colonel Seeley described the national roster already prepared by the medical and dental professions for this purpose. The following routine has been established:

The selection of professional personnel in these classifications is to be on a voluntary basis as much as possible. To the original questionnaire to physicians sent out 23 months ago, more than 159,000 physicians responded, more than 50 per cent of whom were willing to volunteer for medical service in case of war. Of those under the age of 45 years, 63 per cent of the single physicians and 48 per cent of the married physicians even at that early date were willing to offer their services.

Colonel Seeley advised all physicians interested in knowing where their special experience would be most useful to apply to the Procurement and Assignment Service, Washington, which will be responsible for supplying the needs of the Army, Navy, Public Health Service, Civil Service Commission, Veterans' Administration, and the Children's Bureau, as well as other government services. No service will commission or employ a person unless cleared by the Procurement and As-

signment Service. According to Colonel Seeley, the Navy will need a total of 3,000 doctors when its enlistment of 500,000 is reached. For the Army, 16,000 new physicians must be supplied by December 1. It is believed that there will be no difficulty in obtaining these officers on a voluntary basis without jeopardy to civilian needs.

Explaining how the service will operate, Colonel Seeley said that, when requests came from the Army or the Navy for doctors with special qualifications, these would be sorted immediately by punch cards from the 180,000 cards for physicians, and the names of physicians meeting the qualifications would be listed mechanically by the machine. One copy would go to the military service inquiring, the other would be broken into state lists and forwarded to the state chairmen of Procurement and Assignment to determine whether or not these men can be spared from their communities at present. According to Colonel Seeley, they will not be assigned to duty unless they can be replaced, if they are essential on staffs of teaching institutions, industrial plants, hospital staffs, public health services, or in private practice. It is expected, however, that all these essential positions ultimately can be filled by men over 45 or by those physically unfit for service under that age and by women doctors, of whom the nation now has 8,000 in active practice.

The responsible appointing officer would then get in touch with those specialists who are qualified and willing to serve and who are cleared by the local medical committee. It would then be possible to determine the rank each should receive in a commission, choosing these in consideration of the man's needs and of many other factors to be determined.

Every physician, dentist, and veterinarian who enrolls in the Procurement and Assignment Service will be

given a certificate to hang on his wall and be authorized to wear an insignia on his lapel showing that he has offered his services in his professional capacity to his country to win the war, even though it may be decided that he is needed in his own community.

CONTINUATION STUDY COURSE IN MILK  
PLANT OPERATION AT MICHIGAN

THE School of Public Health at the University of Michigan, Ann Arbor, is offering a series of in-service, non-credit training courses of which the first will be a course on May 12 and 13 for operators, owners, and managers of milk pasteurization plants. Other courses planned in this series will provide instruction for individuals employed in public health services, physicians and dentists in private practice, and other professional groups with a major interest in health science services, as well as courses for business, trade, and professional groups whose interests and occupations touch closely the problem of public health, such as hotel and restaurant managers, well drillers, plumbers, health board members, school officials, public works and service officials, probate judges, etc.

A special faculty group brought together for the occasion has been provided for the course for milk pasteurization plant operators. Emphasis will be laid on the health phases and sanitary aspects of the problem. The course is expected to represent a coherent unit of instruction rather than a series of unrelated lectures.

Participants in this course will include Henry F. Vaughan, Dr.P.H., Dean of the School of Public Health, Ann Arbor, James A. Tobey, Dr.P.H., New York, R. S. Breed, Ph.D., Geneva, N. Y., Milton J. Rosenau, M.D., Dean of the School of Public Health, University of North Carolina, Walter D. Tiedeman, C.E., New York State Department of Health, Albany, W. L.

Mallman, Ph.D., Michigan State College, among others. The fee for registration and enrollment is \$5.00. Further information can be obtained from the School of Public Health, University of Michigan, Ann Arbor.

EIGHTH PAN AMERICAN CHILD CONGRESS,  
WASHINGTON, MAY 2 TO 9

THE announcement has been made by the U. S. Department of State and the officials of the International American Institute for the Protection of Childhood, Montevideo, that the Eighth Pan American Child Congress will be held as scheduled May 2 to 9 in Washington with a program somewhat revised in consideration of the outbreak of war.

The entry of the United States and certain of the other American republics into the world conflict has necessitated reconsideration of the plans for the Congress in the light of war conditions and the resultant effects upon children. The Organizing Committee has consulted various individuals and organizations in the other American republics, as well as interested groups in the United States and the pertinent departments and agencies of the federal government in order to determine the basis upon which the meeting is to be organized under present circumstances. The committee has reached the conclusion that under war conditions it is even more important than in peace times to proceed with the plans for the promotion of inter-American coöperation in the protection and welfare of children.

It has been decided, therefore, in consideration of all the attendant circumstances to modify the scope and objectives of the Congress with a view to giving special emphasis to measures for maintaining and strengthening essential services to meet wartime needs, and to laying the foundations for closer inter-American collaboration for the protection of childhood in the war and post-war periods.

# EXAMINATION FOR ASSISTANT SANITARY ENGINEERS, U. S. PUBLIC HEALTH SERVICE

**A**N examination for appointment as Assistant Sanitary Engineer in the regular commissioned corps of the U. S. Public Health Service has been announced for Washington, D. C., Cincinnati, New Orleans, Kansas City, and San Francisco on May 11. Candidates must be not less than 23 years nor more than 32 years of age and must have had at least 7 years of educational and professional training following high school, or experience equivalent thereto. They must have graduated from a reputable professional school granting a degree in engineering. In addition the applicant will be required to pass a satisfactory physical, academic, and professional examination. Compensation, including allowance for quarters and subsistence, will be \$3,158 and \$2,699 for officers with and without dependents, respectively.

## MASSACHUSETTS INSTITUTE OF TECHNOLOGY

**T**HE Department of Public Health at the Massachusetts Institute of Technology is offering an accelerated program of public health training beginning June 8 and allowing for the completion of a Master's degree on February 6. These training programs are organized for public health engineers, health educators, and public health laboratorians, as well as for administrators. Special summer courses are also being offered.

## "HIDDEN HUNGER"

**T**HE Honorable Paul V. McNutt, Administrator of the Federal Security Agency, asks the assistance of public health workers in having the recently released film entitled "Hidden Hunger," which is sponsored by the

Office of Defense Health and Welfare Services, shown in their communities.

The purpose of the film is to help win the war on the food front, and it will soon be shown in theatres from coast to coast. Health workers can help in urging the public to see it when it is shown in their localities.

More complete information on the film appeared on page 319 of the March issue of the JOURNAL.

## RESOLUTION ON THE DEATH OF JOHN P. RUSSELL, M.D.

**T**HE California State Board of Public Health at its meeting in Sacramento on March 20 voted a resolution of regret at the sudden death of John P. Russell, M.D., Chief of the Industrial Hygiene Services of the California State Department of Health since 1937. The resolution points out that his services represented an outstanding and a brilliant effort in the development of industrial hygiene, both in peace times and, more recently, while the nation has been at war.

Dr. Russell died suddenly in Berkeley on March 17. Bertram P. Brown, M.D., the California Director of Public Health said, "In Dr. Russell there was that rare combination of successful administrator and sound research scientist. . . . The state was exceedingly fortunate in having Dr. Russell's assistance during the formative years of the industrial hygiene program."

## PERSONALS

### Central States

**FRED L. ADAIR, M.D.,\*** Mary Campau Ryerson, Professor of Obstetrics and Gynecology, and Chairman of the Department, University of Chicago, The School of Medicine, Chicago, Ill., has been appointed Chief of the Division of Maternal and Child Hy-

\* Fellow A.P.H.A.

giene of the Illinois State Department of Health, Springfield.

CHARLES W. ATKINSON, of Boswell, Ind., has been reappointed as Health Officer of Benton County.

WILLIAM H. CAREY, JR., has been appointed as Regional Sanitary Engineer for the 6th and 7th Civilian Defense Regions with headquarters in Chicago, it is announced by the Office of Civilian Defense. Mr. Carey has been a public health engineer with the U. S. Public Health Service and Assistant Engineer with the Michigan State Department of Health.

ELTON R. CLARKE, M.D., of Kokomo, Ind., has been named Health Officer of Howard County.

JAMES H. CROWDER, M.D., II, of Sullivan, Ind., has been named Health Officer of Sullivan County.

ORVILLE A. DELONG, M.D., of Elizabethtown, Ind., has been reappointed as Health Officer of Bartholomew County.

CHARLES T. DOLEZAL, M.D., Assistant Clinical Professor of Medicine, Western Reserve University School of Medicine, Cleveland, Ohio, has been appointed Welfare Director of Cleveland.

GEORGE R. DOUGLAS, M.D., of Valparaiso, Ind., has been named Health Officer of Porter County.

THEODORE DOZOIS, PH.D., Bacteriologist and Serologist for the North Dakota State Department of Health laboratory at Bismarck, has resigned to accept a teaching and research position at Western Reserve University, Institute of Pathology, Cleveland, Ohio.

CHARLES L. FAHNESTOCK, M.D., of Lincoln, Neb., was appointed Supervisor of the State WPA Public Health Projects on February 1.

ROBERT M. FERGUSON, M.D., Indianapolis, has been named Director of Health District No. 4, with headquarters in Rising Sun. He succeeds DR. GEORGE M. BROTHER,<sup>†</sup> who is now Chief of the Bureau of the local health administration, Indianapolis. District No. 4 includes the counties of Dearborn, Ripley, Jefferson, Switzerslands, and Ohio.

WESLEY GILBERTSON, B.S., M.S.,<sup>†</sup> and HARRY G. HANSON, B.S., M.S., both of the Sanitary Engineering Division of the North Dakota State Department of Health, have been employed by the U. S. Public Health Service and are doing malaria control work at Atlanta, Ga.

JOHN S. GILKISON, M.D., of Shoals, Ind., has been named Health Officer of Martin County.

FRED W. GRAYSTON, of Huntington, Ind., has been reappointed as Health Officer of Huntington County.

JAMES R. HAMILTON, M.D., of Mitchell, Ind., has been appointed City Health Officer, to succeed the late JAMES D. BYRNS, M.D.

OLAF HAROLDSON, M.D., who has been doing private practice in North Dakota, has been appointed Health Officer for a city-county health unit at Minot, N. D. Dr. Haroldson and E. L. SEDERLIN, M.D.,<sup>†</sup> City Health Officer of Fargo, N. D., are doing advanced field work in the State of Missouri.

OSCAR S. HELLER, of Greenfield, Ind., has been reappointed as Health Officer of Hancock County.

JAMES E. KEELING, M.D., of Waldron, Ind., has been named Health Officer of Shelby County.

OLIVE E. LEE, R.N.,<sup>†</sup> Assistant State Supervisor of Public Health Nursing, North Dakota State Department of Health, has recently been appointed Consultant in Nursing for the American Red Cross and will be stationed in the midwestern district.

\* Fellow A.P.H.A.

† Member A.P.H.A.

## Eastern States

CAPTAIN CHARLES C. AGAR, Senior Sanitary Engineer, in charge of sewage disposal plants, State Department of Health, Albany, N. Y., was called for active duty and reported to the Commanding Officer at Fort Dix on April 1.

ROBERT S. BREED, PH.D.,\* Chief and Research Bacteriologist, New York State Agricultural Experiment Station, Geneva, N. Y., has for some months been on leave in Latin America, consulting on problems of milk production under the auspices of the Inter-American Committee for the Dairy Industry.

WILLIAM A. BRUMFIELD, M.D.,\* Director of the Division of Syphilis Control of the New York State Department of Health, Albany, has been called for duty with the Army Medical Corps, effective April 13. In his absence JAMES H. LADE, M.D.,† will act as Director of the Division of Syphilis Control.

ALTON S. FELL, M.D., of Trenton, N. J., retired recently as Health Officer of Trenton, after a service of 43 years.

S. S. GOLDWATER, M.D.,\* formerly Commissioner of Hospitals and now President of the Associated Hospital Service, New York, N. Y., was cited for "his invaluable contributions to the art of hospital planning and his outstanding services to the City of New York as Commissioner of Hospitals" at the 85th anniversary dinner of the New York Chapter of the American Institute of Architects on March 10.

JOHN HALL,\* Field Supervisor with the Venereal Disease Division of the New Jersey State Department of Health, Trenton, N. J., has been appointed by the U. S. Public Health Service as a public health engineer on the

staff of District No. 3, with headquarters in San Francisco, Calif. This district includes California, Oregon, Washington, and Nevada. Mr. Hall is Executive Secretary of the New Jersey Health and Sanitary Association.

A. J. LANZA, M.D.,\* Assistant Medical Director of the Metropolitan Life Insurance Company, New York, N. Y., has been appointed Lieutenant Colonel in the Medical Corps of the Army and assigned to the Division of Industrial Health in the office of the Surgeon General, Washington, D. C. Colonel Lanza will be Chief of the Occupational and Military Hygiene Sub-Divisions, Preventive Medicine Division, and will have responsibility for initiating, coördinating, and supervising all activities of the Medical Department in connection with the industrial hygiene program of the Army.

A. HELEN MARTIKAINEN, M.P.H.,† Health Education Secretary of the Hartford Tuberculosis and Public Health Society, Hartford, Conn., has resigned, effective June 1, to become Assistant Health Education Consultant under the U. S. Public Health Service.

DR. EDWIN P. MAYNARD, JR., has been appointed Chairman of the New York Heart Association, the Heart Committee of the New York Tuberculosis and Health Association.

LIEUTENANT DANIEL P. McMAHON,\* District State Health Officer with headquarters in Amsterdam, N. Y., was called for active duty with the U. S. Navy and reported at the Norfolk Naval Hospital, Portsmouth, Va., on February 26. DR. C. A. SARGENT, who has been on sick leave for several months, replaces Lieutenant McMahon at Amsterdam.

CLAUDE C. PIERCE, M.D., who retired March 1 as a Medical Director of the U. S. Public Health Service after 42

\* Fellow A.P.H.A.

† Member A.P.H.A.

years of service, latterly in charge of District 1, New York, N. Y., has been appointed Medical Director of the Planned Parenthood Federation of America, Inc., New York, N. Y. This organization was formerly the Birth Control Federation of America, Inc.

M. J. PLISHNER, M.P.H.,† of the staff of the Brooklyn Tuberculosis and Health Association, Brooklyn, N. Y., has been called to the Army as 1st Lieutenant in the Sanitary Corps and is now stationed at Ft. Story, Va.

JOHN W. TRASK, M.D., has been appointed Acting Health Commissioner of Pittsfield, Mass. Dr. Trask retired recently after a career in the U. S. Public Health Service, serving at one time as Assistant Surgeon General in charge of the Division of Sanitary Reports and Statistics and more recently as Medical Officer in charge of various Public Health Service hospitals.

#### Southern States

ERNEST A. COOK, M.D.,† of Wedowee, Ala., has been appointed Health Officer for Cleburne County, succeeding CORINNE S. EDDY, M.D., M.S.P. H.,† of Centerville, resigned.

HATCH W. CUMMINGS, M.D., is the new Health Officer of Hearne, Tex.

COLONEL GEORGE C. DUNHAM, M.D., DR.P.H.,\* Washington, D. C., M. C., U. S. Army, on his appointment as Director of the Division of Health and Sanitation in the Office of Inter-American Affairs, U. S. Department of State, was appointed Brigadier General. The United States Congress confirmed the appointment on March 2 before General Dunham left for South America.

CHARLES JACK FISHER, M.D., of Montgomery, Ala., has been appointed

Health Officer of Tuscaloosa County, effective April 1. He succeeds ARTHUR A. KIRK, M.D., who resigned after many years of service. Dr. Fisher, who is now in charge of the venereal disease program of the State Department of Health, formerly served as Health Officer of Butler County.

HUGH R. LEAVELL, M.D., DR.P.H.,\* Health Officer of Louisville, Ky., has been appointed Director of Health for a newly consolidated health unit made up of the Louisville City and Jackson County Health Departments. The consolidation has been accomplished through an act of the Kentucky State Legislature and includes not only the health departments but the medical care programs, the City Hospital and the tuberculosis sanatorium.

THOMAS M. LITTLEPAGE, M.D., of Mount Sterling, Ala., has been appointed Health Officer of Choctaw County.

WILBUR D. LUNDQUIST, M.D.,† of Waynesboro, Ga., Health Commissioner of Burke County, will during the present year devote half of his time to Jenkins County, which has been without a Health Officer since ISBIN S. GIDDENS, M.D.,† of Millen, resigned to enter the Army.

HAROLD MARKS, M.D., Passed Assistant Surgeon (R), U. S. Public Health Service, has been assigned to the Medical Division of the Office of Civilian Defense. Dr. Marks recently has been at the National Institute of Health, Bethesda, Md., and was engaged in making medical surveys of medical care in defense communities.

ANTHONY RALPH MARSICANO, M.D., formerly of Coolidge, Ga., has been named Health Commissioner of Coffee County.

WILLIAM B. PATTERSON, M.D.,\* of Brownfield, Tex., is the new Director of the five county health unit serving Dawson, Hockley, Yoakum, Gaines,

\* Fellow A.P.H.A.

† Member A.P.H.A.

and Terry Counties, with headquarters in Brownfield.

DUDLEY A. REEKIE, M.D., who has been Chief Medical Officer of the Tennessee Valley Authority, Chattanooga, has been appointed Regional Medical Officer of the First Civilian Defense Region, with headquarters in Boston. Dr. Reekie was formerly associated with the Kentucky State Board of Health as Field Director of County Health work.

LEONARD A. SCHEELE, M.D.,† Passed Assistant Surgeon, U. S. Public Health Service, has been assigned to the Medical Division of the Office of Civilian Defense, to serve on its Washington staff.

PAUL L. WERMER, M.D.,† of Gilmer, Tex., has been named Health Officer of Upshur County.

STEPHEN W. WILSON, M.D., of Gilmer, Tex., was recently chosen Director of the new City Health Unit at Atlanta, Tex.

#### Western States

D. M. BISSELL, M.D.,† has been appointed Health Officer of the City of San Jose, Calif., succeeding Dr. H. C. BROWN, who died. Dr. Bissell was formerly Health Officer of Monterey County.

#### Hawaii

MARY H. LEMON,\* Registrar General of Vital Statistics, Board of Health, Honolulu, is retiring from Public Service in Hawaii.

#### Canada

DR. KINGSLEY KAY,† who has been Acting Chief of the Division of Industrial Hygiene, Department of Pensions and National Health, Ottawa, Ont., is now on active service with the Royal Canadian Navy, Technical Branch.

#### Foreign

DR. ALBERTO RECIO,† has been appointed Director of Sanitation in the Ministry of Health and Welfare of Cuba, Havana.

JULES THEBAUD, D.D.S., of Port au Prince, Haiti, was appointed Director of the National Department of Hygiene and Public Health in Haiti on January 16. He has been director of the dental school in Port au Prince since 1928, and is the founder and President of the Société Dentaire d'Haiti.

#### DEATHS

M. LOUISE DIEZ, M.D.,\* Director of the Division of Child Hygiene of the Massachusetts Department of Public Health for the last 13 years, died April 11, at the age of 63. Before her State appointment, Dr. Diez had held positions in Philadelphia hospitals and in Providence, R. I. Then she served as obstetrician in the Division of Maternity, Infancy and Child Hygiene, New York State Department of Health, and as Associate Director of the same Division.

ROBERT W. HEGNER, PH.D., Professor of Protozoölogy at the Johns Hopkins University School of Hygiene and Public Health, Baltimore, Md., died on March 11, at the age of 62.

JOHN P. RUSSELL, M.D., M.S.P.H.,\* of Berkeley, Chief of the Industrial Hygiene Services of the California State Department of Public Health, died on March 17.

ROCK SLEYSER, M.D., psychiatrist of Milwaukee, Wis., died March 7. He was President of the American Medical Association in 1939.

MARTHA TRACY, M.D., DR.P.H.,† Assistant Director of the Philadelphia Department of Public Health, died March 22, at the age of 65. A graduate in 1904 of the Woman's Medical College in Philadelphia, Dr. Tracy received the Dr.P.H. in 1917 from

\* Fellow A.P.H.A.

† Member A.P.H.A.



the University of Pennsylvania. In 1924 she became Professor of Preventive Medicine at the Woman's Medical College, and in 1931 Dean, in which position she served until she became Assistant Director of the

Department of Public Health in 1940.

JOHN A. VOGLESON, Civil Engineer, Philadelphia, Pa., died on January 16. Major Vogleson was a Charter Fellow from 1923 to 1933.

## CONFERENCES AND DATES

- American Home Economics Association. Boston, Mass. June 21-24.
- American Library Association. Milwaukee, Wis. June 21-27.
- American Medical Association—93rd Annual Meeting. Convention Hall, Atlantic City, N. J. June 8-12.
- American Medical Women's Association. Atlantic City, N. J. June 6-7.
- American Ophthalmological Society. Hot Springs, Va. June 1-3.
- American Psychiatric Association. Hotel Statler, Boston, Mass. May 18-22.
- American Public Health Association—71st Annual Meeting. Headquarters, Municipal Auditorium, St. Louis, Mo. October 27-30.
- American Society for Clinical Investigation. Atlantic City, N. J. May 4.
- American Society of Civil Engineers. Summer Meeting. Upper Mississippi. July.
- American Society of Clinical Pathologists. Philadelphia, Pa. June 5-7.
- American Society of Planning Officials—Joint Conference with National Conference on Planning. Indianapolis, Ind. May 24-28 (tentative).
- American Therapeutic Society. Atlantic City, N. J. June 4-6.
- American Water Works Association—Pacific Northwest Section—Marcus Whitman Hotel, Walla Walla, Wash. May 7-9.
- Ohio Section—Commodore Perry Hotel, Toledo, Ohio. May 14-15.
- Annual Convention—Conference on War-time Water Works Problems. The Stevens Hotel, Chicago, Ill. June 21-25.
- Michigan Section—Park Place Hotel, Traverse City, Mich. September 9-11.
- Western Pennsylvania Section—Roosevelt Hotel, Pittsburgh, Pa. September 18.
- Minnesota Section—Lowrey Hotel, St. Paul, Minn. September 24-26.
- Civil Service Assembly—Eastern Regional Conference. Albany, N. Y. June 5-6.
- Dental Health Week. May 1-8.
- Georgia Public Health Association. Atlanta. May 28-30.
- Institute of Food Technologists. Minneapolis, Minn. June 15-17.
- May Day—Child Health Day. May 1.
- Michigan Public Health Association. Grand Rapids. November 11-13.
- Missouri Public Health Association. Kansas City. May 7-9.
- National Association of County Officials. Hollywood, Calif. May 20-23.
- National Association of Housing Officials. Baltimore, Md. May 11-13.
- National Boys and Girls Week. April 25-May 2.
- National Conference of Social Work. New Orleans, La. May 10-16.
- National Congress of Parents and Teachers Association. San Antonio, Tex. May 3-7.
- National Council of State and Local Public Welfare Administrators. May.
- National Education Association. Denver, Colo. June 27-July 2.
- National Gastroenterological Association. Biltmore Hotel, New York, N. Y. June 3-6.
- National Institute for Traffic Training—5th Annual Institute. New Haven, Conn. June 15-26.
- National Noise Abatement Week. May 31-June 6.
- National Organization for Public Health Nursing. Biennial Convention. Palmer House, Stevens Hotel and The Coliseum, Chicago, Ill. May 18-22.
- National Tuberculosis Association—38th Annual Meeting, held jointly with American Trudeau Society—37th Annual Meeting, and National Conference of Tuberculosis Secretaries—20th Annual Meeting. Hotel Bellevue-Stratford, Philadelphia, Pa. May 6-9.
- New York State Association of Milk Sanitarians—20th Annual Conference. DeWitt Clinton Hotel, Albany, N. Y. September 23-25.
- New York State Association of Public Health Laboratories—26th Annual Meeting. Mary Imogene Bassett Hospital, Cooperstown, N. Y. May 18.
- New York State Conference of Mayors and Other Municipal Officials. Syracuse, N. Y. June 8-10.
- New York State Sewage Works Association—Spring Meeting. Hotel Ten Eyck, Albany, N. Y. June 5-6.

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## The Index Person—Relation to Incidence Rates in Family Studies\*

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MUCH of the information available regarding the communicability of various diseases and the conditions related to exposure, susceptibility, and immunity is derived from observation of their spread or failure to spread in attacked families. Most studies of disease within family or household groups have been presented, however, in an incomplete form, so that the published data are unsatisfactory for comparative purposes and are difficult to interpret. The correction of these defects is not always a simple matter, for the use of family units as a basis for study introduces unexpected complications, and these complications are not the same for acute as for chronic diseases.

The systematic study of the acute communicable diseases, using the family or household as a unit, has been due

largely to the work of the late Charles V. Chapin<sup>1</sup> and his development of the so-called "secondary attack rate" to measure the risk of persons exposed to a disease in another member of the same household. The secondary attack rate can be compared with the incidence in the general population to show the increased risk resulting from familial exposure. In calculating secondary attack rates, the primary cases which introduce the disease into the attacked families are excluded from the tabulations because they do not belong to the same universe of study as do their household associates. The universe of study to which the primary cases belong is the general population, whereas the familial associates comprise a universe in themselves, since they represent all persons living in familial contact with the primary case.

The use of secondary attack rates cannot readily be carried over into studies of chronic disease to measure the risk within attacked families. For one thing, it is impossible in most instances to denominate the primary case

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\* Read at a Joint Session of the Vital Statistics and Epidemiology Sections of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 16, 1941.

† From the Departments of Epidemiology and Biostatistics (Paper No. 219), School of Hygiene and Public Health, The Johns Hopkins University. Supported by a grant from the Commonwealth Fund.

who must be responsible for the introduction of the disease into the family. Attempts to use the "earliest known case" as the primary case, and calculate secondary attack rates on this basis, give a pseudo secondary attack rate which is too high to represent the risk within exposed families, for reasons which will be discussed later.

Another difference between the study of acute and chronic disease is that, in the chronic diseases, the period of peculiar risk within attacked families is not confined to a few weeks, as in the acute conditions, but instead extends over a period of years. Because it is difficult to keep a sufficiently large group of people under systematic observation for a long period of time, most studies of chronic disease within family groups have been of a *retrospective* nature, and rely upon such simple facts as may be expected to lie within the memory of the average householder.

These difficulties have so far defied all attempts to calculate secondary attack rates in chronic disease studies, but they do not prevent the calculation of incidence rates for these families, provided the analysis of the family experience is linked with the time of onset of the disease in the person responsible for the selection of the family, *i.e.*, the index person.\* Such rates must of course accommodate for time by using some form of modified life table procedure and expressing the population at risk in person-years of experience.<sup>2, 3</sup> These rates, while not secondary attack rates, are true incidence rates, and can be compared with the incidence in the general population. It is thus possible to measure the risk in these families and its relation to that in the population proper for the period subsequent to the

onset of the disease in the index person and, in certain cases, for the period prior to this onset. Such rates are meaningful, are readily interpreted, and are of distinct value in the study of chronic disease.

Although the late Dr. Wade Hampton Frost is largely responsible for the introduction of the use of these rates to measure the risk in attacked families, he had published no report on the subject at the time of his death. The purpose of this article is to repair this deficiency and to consider in broad terms the determination of incidence rates in family studies in relation to the bias introduced by the index person.

#### DEFINITION OF TERMS

The term "family" is used to refer to the group of individuals who dwell together as a household under one roof. That is to say, a family is composed of a group of people, usually of close kinship, who are living in intimate contact with each other and who share a common environment. It is, as a rule, a readily delineated group, and is a unit which can without great difficulty be kept under observation. The terms "family" and "household" are used synonymously throughout the discussion.

The "index person" is defined as that member of the family responsible for its inclusion in the study. Whenever the household is used as the unit of study, there must be an index person in each family, although this fact is not at first apparent. In most instances the families are selected for study because a specific event, such as attack with a disease, is known to have occurred in some one member of the household. This person is denominated the index person because, although not necessarily the first member of the family in whom the event has occurred, he is the first member of the family to come to the attention of the investigator. If the event is a reportable disease, the terms

\* The term "index person" is used in preference to the term "index case" in common use because the word "case" carries certain implications not always fulfilled by the index person. The index person is sometimes referred to by geneticists as the "proband."

"index person" and "first case reported from the family" are synonymous. In other instances, where no attempt has been made to select families because of a specific occurrence to one of its members, and all families within an area are studied, it would appear that there would be no index person because no conscious selection of families is made. Even in such cases, if the study is a dynamic one, there is an implicit selection of families due to the person responsible for the maintenance of the family as a unit. Through this responsibility, this individual acts as the index person. This concept will be discussed in some detail later.

The term "population at risk" is used to describe the particular group of individuals (the universe) in which each is liable to the event in question. In calculating the usual annual mortality and morbidity rates, the population at risk is defined as the mean population under consideration during the year of observation. In family studies dealing with chronic disease, the population at risk is usually expressed in person-years\* of observation, when an annual rate is desired.

The term "incidence rate" expressed for a specific unit of time refers to the rate derived from the application of the formula

$$\text{Incidence rate} = \frac{\text{Number of events in the population at risk in the specified time}}{\text{Mean population at risk of event during specified time}} \quad (1)$$

(X)

In this formula the event may be death, contraction of a disease, or any other defined occurrence. The rate may refer to the number of events in 1 week, 1 year, 10 years, etc., depending upon the time specified. In the study of chronic disease it is more usual to derive the incidence rate from the formula:

$$X = \frac{\text{Number of events in population at risk during observation}}{\text{Person-time units of risk during observation}} \quad (2)$$

This formula is the equivalent of formula (1), but its expression shows more clearly that allowance is made for variation in the length of observation for different individuals. A person-time unit of risk may be 1 person at risk for 1 year, 1 week, 1 month, etc., depending upon the time unit selected. In the following discussion of incidence rates, the time unit will be selected as a year, merely for the sake of concreteness, but the discussion applies equally well to rates based on any other specified unit.

#### ANALYSIS OF INCIDENCE RATES DERIVED FROM FAMILY STUDIES

In setting up for families incidence rates which are comparable to those for the general population, it is necessary to consider how the event for which the families were selected is related to the event for which the incidence rate is set up. A formula for calculating incidence rates including all members of the family may be expressed

$$X = \frac{\text{Number of events in members of the family during observation}}{\text{Person-years of risk in members of family during observation}} \quad (3)$$

Such a rate is comparable with that in the general population only if, for the event in question, all members belong to the same universe of study. The pertinent question, then, is how the index person, who brought the rest of the family into the study, came into the study himself. If his selection was related to the event under study, while that of the rest of the family was not, then all members of the family do not belong to the same universe of discussion. This point can be illustrated by considering the various relationships which can exist between the event which caused selection of the index person and the event which is being studied, and

\* One person-year means 1 individual observed for 1 year, or its equivalent.

these will be discussed in four different classes.

I. *Families chosen because the event being studied has occurred in the index person—*

The great majority of family studies of disease are of this type. They are set up to study the further occurrence of a disease in households where it is already present, households being chosen in which at least one member is known to be suffering from the disease. The individual thus responsible for the inclusion of the family is the index person, and he may be one of a series of reported cases or of admissions to a hospital or clinic. The selection of the index person involves, therefore, his having the disease which is to be studied, and his coming to the attention of the investigator through clinic attendance or other case discovery mechanism. The index person is not selected because he is a member of the family; rather, the family is selected because of its association with the index person. The individuals in the family group, therefore, may be broken into two distinct classes, (a) the index persons, and (b) their familial associates, and we may consider these two classes as they relate to incidence rates.

(a) *Index persons*—Since in the present class of problem, all index persons must by definition have the event under consideration, they are 100 per cent attacked. If they are included in the calculation of incidence rates, they must all appear in the numerator of the rate. These persons do not come from the universe of the family group but, instead, from a broader and much less definite universe. For instance, where index persons are selected because of attendance at a clinic, the universe from which they are drawn may be defined as "all persons who, if they had developed the disease, would have come to that particular clinic." This is an

unmeasurable universe, since there is no method of knowing what individuals (who did not develop the disease) would have come to the clinic if they had been attacked. Where index persons are an entire group of legally reported cases of a disease, the universe is measurable, and may be taken to be the entire population of the area. In no case, however, can it be considered as being the family group.

(b) *Familial associates of index persons*—These individuals are selected because they share a common environment with the index persons. They comprise a complete universe in themselves and, in addition, are selected without prior knowledge of the occurrence of the disease among them.

With the family membership separated into these two classes, we may inquire into the justification of combining them into formula (3), which calls for dividing all the cases in both index persons and their associates by the combined person-years of risk in the two groups. Since the justification for setting up the combined rate depends upon the two groups coming from the same universe of discussion, we shall examine the two groups for this issue.

If we consider the contribution of the familial associates of the index persons (group b) to the whole experience, we may set up the ratio

$$\frac{\text{Number of events in associates during observation}}{\text{Person-years of risk of associates during observation}} \quad (4)$$

This is a true incidence rate because the denominator forms a complete universe and the numerator contains all the events which occurred within it. The group was not selected for the presence of the disease, but merely for the association with the index person, and the incidence rate may be compared with that of the general population to see the effect of this association.

On the other hand, the contribution

of the index persons (group a) to the total family experience is of different character. Setting up a similar ratio for their contribution, we have as stated earlier all the index persons in the numerator, since they were selected because they were known cases. The ratio is then

$$\frac{\text{Number of index persons}}{\text{Person-years of risk of index persons during observation}} \quad (5)$$

The denominator of this ratio needs some clarification. Since the index person had already been attacked when selected for study, the observation period is a retrospective one, and dates from his entrance into the family unit. Formula (5) therefore divides the number of index persons by their total years of experience from entrance into the family until attack. This expression is then merely the proportion of these known attacks which occurred per year. It is obvious that the denominator does not include the universe at risk of becoming an index person, and hence the ratio is not an incidence rate at all.

We note, therefore, that where families are chosen because the event being studied has occurred in the index person, the members of these families must be considered as having come from two distinct universes with respect to this event. The type of data obtainable for index persons is not comparable to that for their associates, and hence the two cannot with justification be lumped together. If these data, which yield "proportion of known attacks occurring per year," and "proportion of persons at risk attacked per year" (*i.e.*, incidence rate) be combined, the resulting conglomeration cannot possibly be interpreted.

We have stated that from the experience of the familial associates of the index person we can set up a true incidence rate, and it is of interest to know how this rate in chronic disease com-

pares with the usual secondary attack rate in acute disease. It is apparent that the two rates are very similar, since in both instances they are calculated from the experience of familial associates of known cases. However, it must be remembered that the index person may not be the same as the primary case, since he is not necessarily the first person attacked.

It might appear possible to secure secondary attack rates in chronic disease studies by substituting "earliest known case" for "primary case" and dealing with the experience of the familial associates of this case rather than with those of the index person. Where, however, families are selected because of the occurrence of disease in the index person, they usually have a larger proportion of multiple cases than would be found in all families in which the disease occurs. This is due to the fact that the probability of there being an index person in the family, that is, the probability of there being a discovered case, increases as the number of cases in the family increases. Hence, there is a tendency to select for study, families having two or more cases and to fail to include a sufficient number of families with only one case. The families in the study may not be representative, therefore, with respect to the occurrence of cases subsequent to the earliest known case, and any pseudo secondary attack rate calculated tends to be too high to serve as a measure of the risk. Since the proportion of primary cases which become index cases is usually unknown, and in all probability varies in different studies, no correction is possible and hence no reliable measure of risk can be obtained on this basis.

Reliable measures of the occurrence of chronic diseases can, however, be obtained by comparing the incidence of a disease among the family associates of index persons after the onset of the index case, with that in the general

population. In studies where there is no bias tending to make the index person the first case in the family, rates may be set up to compare the experience of the family associates prior to and subsequent to onset of the index case. In making such analyses, the index person is not a part of the universe of study, and should be excluded from the tabulations.

*II. Families chosen because the event being studied is related to an event which has occurred in the index person—*

This situation involves the same logical issue as that discussed above. The difference in the two classes of problem is one of degree only, for in this case the event being studied has not necessarily occurred in the index person, but it is related to the event for which he is selected. Thus, the members of the family belong to two distinct universes, since the risk of the event for the index person, although not certain as before, is different from that for his familial associates. This case is illustrated by studies of the mortality from tuberculosis in families in which the index person is known to be suffering from the disease. Here the event being studied is death, and the event which has occurred in the index person is the development of tuberculosis. In analyzing formula (3) for the inclusion of all members of the family, we find that the contribution of the index person is

$$\frac{\text{Number of events in index person during observation}}{\text{Person-years of risk in index persons during observation}} \quad (6)$$

In this instance the index person has had an event, the onset of the disease, which makes him more liable to the event, death, which is being studied. We thus obtain an incidence rate of mortality among these persons which is the mortality rate of persons known to have the disease. This rate must neces-

sarily be much higher than any rate calculated for the household associates of these index persons from

$$\frac{\text{Number of events in associates during observation}}{\text{Person-years of risk of associates during observation}} \quad (7)$$

because the probability of mortality is greater among those who are known to have the disease than among their associates for whom the occurrence of the disease is not mandatory. While in this case we have two incidence rates, they are of a different order, and hence should not be combined. If the purpose is to obtain a measure of the comparative risk of death in these families and the general population, the index persons must be excluded from the tabulations, and the analysis be confined to the experience of their household associates.

*III. Families chosen for an event in the index person which is not related to the event being studied—*

If the selection of the index person is by some mechanism having no relationship to the event under study, then the index person and his family share a common risk to the event, and may be considered as belonging to the same universe. This case is illustrated by such studies as those of the common cold in the families of army officers. Here the index person enters the study because he is an army officer, which bears no appreciable relationship to risk of the event under consideration, namely, the common cold. In setting up the rate for common cold, formula (3) may be used and it is unnecessary to exclude the index person or to consider his experience separately.

*IV. All families in an area included in the study—*

When all families in an area are included, it might appear that there was no selection involved and that we were dealing with the case just considered

under (III). However, in dynamic studies which are retrospective, where the family is the unit, there is a bias present which is related to the index person. This is most apparent in studies on mortality, and will therefore be discussed for this case.

Suppose a canvass were made of all families resident in a city as of January 1, and reasonably accurate answers were obtained to the following questions from each family present:

1. How many people live in the household now?
2. How many people lived in this household a year ago?
3. How many people died in this household during the year?

It might be expected that the mortality rate for this city during the year could be obtained from the formula

$$\frac{\text{Number of deaths in families during year}}{\text{Mean population of families during year}} \quad (8)$$

but this rate would be too low to represent the mortality rate in the city.

The reason for this is that, in spite of the fact that all families present in the city at the end of the year are included, these are not all of the families present *during* the year. Only those families which are existent on the day of survey are included, and no data have been obtained on the families which ceased to exist as such during the year. To appreciate the bearing of this on the mortality rate, we should consider the reasons for families passing out of existence.

It is, of course, apparent that a family will cease to exist if all of its members die. This is not a rare occurrence in one-member families, it is less frequent in two-member families, and the probability of its occurrence decreases as the size of the family increases. It is certain, however, that if no member of the family remains alive, the family is non-existent, and when a survey is made, no record will be obtained of such families,

although deaths in them will have contributed to the total mortality of the area.

But it is not necessary for all members of a family to die for the unit to become nonexistent. For example, if a family consists of a widow and 4 young children, the death of one of the children would not necessarily break up the family unit, but if the mother dies, there may be no other individual capable of maintaining the family as such. The result is that the family is dispersed, the children enter new households, and any data obtained upon them in the survey will not include their experience in the "dead" family. In general, we can say that families break up because of the removal from the group (by death or for other cause) of one member whose continuance in the household is essential for its existence as a unit.

If families break up for this reason, it follows that if they are to continue to function as units, each must contain at least one individual capable of holding the group together—one member who serves as a "binding post" to maintain the unit. This means that in each existent family there is one individual (almost invariably an adult) who *must* be living. This individual is designated the index person because his survival to the time of investigation is responsible for the inclusion of the family in the study.

With this in mind, let us now consider the composition of the population on which we obtained data in the canvass covering all families of the city, and the contribution of its members to the mortality rate of formula (8). The contribution of the index persons may be expressed as

$$\frac{0}{\text{Mean population of index persons during year}} \quad (9)$$

since the index person, by definition, must be living. The contribution of the



familial associates of the index person is

$$\frac{\text{Number of deaths among familial associates during year}}{\text{Mean population of familial associates during year}} \quad (10)$$

which is a true rate.

This analysis indicates that the index person is not at risk of the event which is being studied. The fact that he can contribute only to the denominator of ratio (8) and not to the numerator is directly responsible for the deficiency of the rate calculated with all members included. To obtain a true mortality rate for the area, the index person must be excluded.

It thus follows that in each family, the member designated as the index person must be determined. In family studies where the households are selected *because* of the occurrence of a specific event in the index person, there is no question of his identity. When all existent families are included, however, the denomination of the index person is not so certain. By our definition, the index person is that individual responsible for the inclusion of the family in the study, and if all existent families are included it is, therefore, the person responsible for the maintenance of the family as a unit. Such a person must almost certainly be an adult and must be capable of holding the household together. In families in which there are two or more such individuals, the preferred method of designating the index person is by some random selection from among the qualified individuals. This method is preferred to that of making the terms "head of the household" and "index person" synonymous, which would tend to exclude an undue proportion of male members from the population at risk.

#### SUMMARY

In investigations where the family is the unit of study, the index person is

the member responsible for bringing the rest of the family into the study. If incidence rates for some event are to be set up on the family experience, and compared with those in the general population, it is critical to determine whether the event causing selection of the index person is in any way related to the event under study. If there is any relationship whatsoever between the selection of the index person and the event for which the rate is set up, then the index person belongs to a different universe of discussion from that of his familial associates, and should be excluded from the calculations. This relationship may be positive, that is, the index person may certainly have, or be at increased risk of having, the event being studied. This case is illustrated by studies of morbidity or mortality of tuberculosis where the index person is a known case. On the other hand, the association may be negative where the index person has no risk, or a decreased risk, of the event in question. This is illustrated by the retrospective study of mortality or morbidity in family groups where the survival of the index person is essential to the inclusion of the family in the study. In all such cases, the experience of the index person and that of his family associates cannot be combined to produce meaningful rates.

In the rather rare family studies where the choosing of the index person is entirely unrelated to the event under study, and where only the family experience subsequent to the time of selection of the family is considered, the index person and his family associates may be considered as belonging to the same universe of discussion, and incidence rates for their combined experience may be set up.

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# Family Records in the Health Department\*

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THE health officer realizes that in the course of his work many services rendered on behalf of an individual affect other members of the household, and sometimes deals with the family as a group when he encounters a specific problem in a home. But much of his thinking is in terms of cases reported and individuals served, and the word "family" seldom appears in health department annual and special reports; or for that matter in textbooks on public health organization. Development of methods for using the family as an administrative unit by nursing and social agencies, and growing interest in studies such as those presented here, make it desirable to explore the situation as to family records now existing in health departments. One may then speculate as to what extent keeping account of services on a family basis might contribute to more efficient administration and provide material for research.

Family information is commonly found in three types of health department records, namely, clinical history sheets, nursing folders, and communicable disease investigation forms. The medical term "family history" was obviously borrowed from hospital and

dispensary practice many years ago and the purpose was to assist the clinician. A space on record forms was sometimes labelled "family history" without amplification, and sometimes the father, mother, and other relatives were mentioned.

Among forms of this type were cards or sheets used in tuberculosis clinics. Here it was the clinician who wanted family data to aid in diagnosis, and the records were not primarily designed for use in contact investigations and other control measures. Some health departments soon found it necessary to keep a roster of members of tuberculous families, but among a group of large cities from which record forms were collected as recently as 1929, there were still two without provision for a household roster on tuberculosis forms. Moreover the term "family history" was repeated on several blanks in all cities.

Public health nurses in official agencies are under the impression that they began to list members of households when home visiting became a part of tuberculosis control. Visiting nurse organizations kept family records much earlier, and were influenced by closely related social and welfare groups. When organized in the 70's, "family societies" apparently copied many of their record keeping systems from charitable organizations in England. By twenty or twenty-five years ago, "so-

\* Read at a Joint Session of the Vital Statistics and Epidemiology Sections of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 16, 1941.

cial data" or "history" sheets were common to social work, and to official and voluntary nursing records. These for the most part, however, were for administering current situations, rather than for keeping permanent, continuous records of what happened to families. An interesting proposal for voluntary continuous registration of important events in family life was made by Taylor in 1912.

Although a fairly diligent effort has been made to do so, it has been impossible to determine by whom the nursing family folder was originally devised or by what nursing service it was first used. Writing in 1920, Olmsted described a family folder for the rural nurse working alone or in a small unit. Discussing the advantages of such a system, she declared that it saves clerical labor, since information regarding the family is not repeated on various forms. She also said that it helps to impress upon the nurse the effect of wages and environment, and aids in coöperation with other agencies; it assists in communicable disease control, and in collecting statistics.

The necessity for having as complete a picture of the family as possible, and for assembling all facts in one place, developed in larger communities with the change from specialized to generalized nursing. Family folders became a part of the record system of many official and voluntary nursing agencies by the middle of the 1920's, and their use has been continued and extended since. Thus, in the nursing field, the family is an established administrative unit, but even here the records may not be suitable for analysis to evaluate activities and services.

According to Frost (1938), Chapin deserves the credit for being the first in this country to list routinely members of households in which communicable disease occurred, and numbers of exposed persons became ill. Dr. Chapin's

own statements quoted by Frost indicate that he thought of using the information he collected for study as distinguished from administrative purposes. He speaks of family records for acute communicable diseases in relation to "scientific investigation" and of "collecting facts which perhaps are not of much value in themselves but may be when the number of cases can be increased." The results of his enumerations of exposed persons and cases among them must have been in his mind when he wrote on fumigation and other subjects, but they are rarely mentioned. And one of his close associates is of the opinion that he regarded his acute communicable disease data as of particular value for special studies.

His example of using local facilities for collecting information has not been followed in many health departments, either with respect to acute diseases or to tuberculosis and other chronic diseases more difficult to handle administratively and statistically. Some years ago it was planned to study mortality in upstate New York from streptococcus infections not diagnosed as scarlet fever but occurring in scarlet fever families. This was to be done by collecting case cards from all over the area and by comparing names of persons on such cards with registered deaths. The enterprise failed because the family roster on most cards was incomplete. Names written down were ordinarily those of children affected by quarantine and school exclusion regulations. Acute disease records such as this collection from a hundred or more local jurisdictions in the 1930's could not have been used for obtaining secondary attack rates, easily calculated from Dr. Chapin's observations long before the turn of the century.

It is apparent from the foregoing that family records have been developed independently by divisions, bureaus, or other units for a variety of reasons, and

that they are incomplete and scattered through health department services. The system devised in Westchester County to consolidate records and to bring the sum of family needs and services into prominence has been previously described in detail (Bellows and Ramsey, 1939).

This system provides for a steady flow of information between the central office and the field. There is a single folder for each family in which all medical and nursing records are bound together. The same folder contains child hygiene, tuberculosis, syphilis and orthopedic clinic records, as well as records of nurses' home visits. After each clinic the folder goes to the central office, where pertinent data are entered on case registers and in the department's master index. At the same time information revealed by the index which came directly to the central office is placed in the folder for the benefit of the field workers. The folder contains a summary sheet on which all services rendered to the family appear except those for minor communicable diseases such as measles and chicken pox. Each new family is cleared through the County Council of Social Agencies, and welfare and other agencies which have been in contact with the family are listed on the summary sheet.

A 4 years' trial has proved the advantages of the new record system. Clinicians find it helpful to have all the medical records of the family at hand when they are examining or advising their patients. Information obtained by physicians in clinics and nurses in the field is pooled, and the folder itself tends to encourage consultation between members of different divisions of the health department in deciding the best interests of the patient. The statistical division, using the same original records as the physician and nurse for its clinic and other reports, adds pertinent facts to them, such as information from case

and laboratory reports and birth and death certificates. The statistical division may find data in the folder of value to itself, such as facts that help in improving the accuracy of death certification, or tuberculosis and syphilis contact registers. Since the coördinated record system was introduced, the proportion of families carried on two or more clinic services has nearly doubled, the increase being from 356 to 708 families.

By using the folders and master index it is possible to obtain many facts of administrative interest. For example, it was found with little effort that among the 6,437 families enrolled on clinic services, 186 are households in which there are or have been cases of both syphilis and tuberculosis. Cancer has been reportable in New York State for only 18 months, but there are known to be 68 health department clinic families with cancer and tuberculosis cases, 24 in which there were both syphilis and cancer, and 8 families with cases of all three chronic diseases.

Additions are being made constantly to the pooled family records, and they should prove a body of information valuable for a wide variety of special studies. A year ago a study was undertaken of tuberculosis among familial associates of tuberculosis cases as compared with the same disease among familial associates of cases of syphilis. The tuberculosis rate among associates of that disease (1 per 100 person-years) was similar to that in other studies, and there was no evidence that tuberculosis was more prevalent among associates of syphilis cases than in the general population.

These findings appear to afford a more or less satisfactory test of the adequacy of the original records. Actually, it was necessary to correct and add to them before analysis could be undertaken. The most common fault was incompleteness of the family roster.

Members of the household who had left or died were often omitted, and sometimes an over zealous nurse listed transient visitors as members of the family. This experience led to a course of instruction for nurses on the content of a family roster, the reasons for filling out a roster completely in relation to their own work, and so that the record might serve research purposes.

The majority of family studies in recent years have been conducted under unusual circumstances with record forms quite different from those in routine use, and often with personnel outside of the regular health department staff. There is no question as to the value to the health officer of keeping his clinic and field records on a family basis. It also seems entirely feasible to maintain health department records of such a character and quality that they will be

suitable for studies in which life table methods and other statistical procedures are employed. And it should be possible to assemble data routinely with much less effort and expense than by special surveys. In other words, it appears that health officers themselves may well take cognizance of newer methods of statistical investigation and, even though unfamiliar with the pitfalls and technics of family studies, should give thought to the consolidation of record systems.

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## Nutrition Foundation Announces Policy for Grants

THE Nutrition Foundation, New York, N. Y., has announced that grants will be made to established institutions in the United States and Canada, the first series becoming effective July 1, 1942.

Problems of critical importance in the war emergency will be given primary consideration. Grants will also be made in the support of projects that

have a direct bearing upon public health.

Special concerns of the Foundation include dental caries, and nutritional requirements of infants, growing children, and the old age group. The Foundation's long-time program will place emphasis upon fundamental research to advance the frontiers of science.

# Illness in the Chronic Disease Family<sup>\*†</sup>

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A STUDY of illness in a relatively small population composed of family units offers an unusual opportunity for observation of morbidity in particular groups of families. This report presents the illness experienced during a 12 month period by the members of 381 families selected because of a case of chronic disease from a total sample composed of 1,757 families living in the Eastern Health District of Baltimore.

In a previous report dealing with chronic disease among middle and old-age persons during the first year of the morbidity study in the Eastern Health District of Baltimore, it was shown that those with serious chronic disease carry the main burden of illness in the population after age 40 is reached. Ambulatory cases formed only 18 per cent of the total population. They not only had a higher frequency of attacks of illness but also suffered an excessive amount of disability in comparison with disability from illness in the remainder of the middle and old-age population. When families with chronic disease cases of all ages were considered, 25 per cent of the total families observed for a 12 month period had one or more members who reported the presence of chronic disease. This means that a considerable burden of

illness falls upon a relatively small proportion of the total families.<sup>1</sup>

The study reported upon previously considered the illness experience of the chronic patients compared with illness in the rest of the population. Since the burden of illness of the chronic patient falls heavily upon his or her family unit, it is of interest to present the complete picture of illness in the chronic disease family by a consideration of the sickness record of the other members of the family, namely, those who have not reported the presence of chronic disease. The rate of illness for the chronic disease family may be compared with that of the remaining population.

When the special study was initiated, the Eastern Health District of Baltimore consisted of two city wards containing 11,896 white families or households, including 43,377 persons, and 3,413 colored households, including 13,784 persons.<sup>‡</sup> As far as the white population is concerned, the district is considered fairly representative of the localities in the city in which the wage earning population lives; that is, it contains some families in relatively poor economic circumstances, wage earning families in moderate circumstances, relatively few families in the professional class, and no families that can be classed as wealthy. Consequently, the

\* Read at a Joint Session of the Vital Statistics and Epidemiology Sections of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 16, 1941.

† From the Division of Public Health Methods of the National Institute of Health and the Milbank Memorial Fund.

‡ A few months after the special study of illness was started, the Eastern Health District was enlarged so that it now includes a population of approximately 100,000. Any reference to the Eastern Health District in this paper, however, is to the former district composed of Wards 6 and 7.

TABLE 1

*Age Distribution of the Sample Population in Thirty-five Blocks in the Eastern Health District of Baltimore, Compared with Total White Population in the District, 1939-1940*

Age	Sample Population (White Families) 1939-1940	Total White Population in Eastern Health District 1939	Sample Population (White Families) 1939-1940	Total White Population in Eastern Health District 1939 *
	Per Cent		Number	
All Ages	100.0	100.0	5,483	43,377
0-4	7.3	6.5	399	2,833
5-9	7.4	6.8	404	2,965
10-14	8.2	8.5	451	3,666
15-19	9.8	9.9	537	4,272
20-24	8.9	10.2	484	4,419
25-29	9.2	9.4	504	4,088
30-34	9.0	8.2	493	3,573
35-44	14.7	14.3	806	6,164
45-54	12.5	12.7	682	5,508
55-64	7.5	7.7	408	3,314
65+	5.5	5.8	301	2,519
Unknown Age	....	....	14	56

\* Obtained from preliminary tabulations of unpublished data collected and analyzed by the Department of Biostatistics of the Johns Hopkins School of Hygiene and Public Health with the assistance of the Baltimore City Health Department.

district cannot be considered as strictly representative of Baltimore as a whole, but it is probably representative of the population which forms the majority in the city.

There are three hospitals within the Eastern Health District and two adjacent to it. Each of these hospitals has an outpatient department. Approximately 150 private physicians practise regularly within the district. However, during the first and second years' study, from 300 to 400 different private physicians served the observed population.

#### DATA AND METHOD OF STUDY

The method of sampling in this particular study has been described in detail in a previous report.<sup>2</sup> It is sufficient here to say that the white families living in thirty-five city blocks formed the sample population. The plan of the study was to follow families that live in a group of houses in certain blocks rather than to follow a selected group of families. No attempt was made to continue visiting families that moved out of these houses during the period of the study, but the new fam-

ilies that moved into the houses vacated in the sample blocks were included in the study. Monthly visiting was employed in this study in order to secure a high degree of accuracy in the reporting of illness. The record of illness started with the first visit to the family; no attempt was made to secure a report of illnesses which had occurred during a period preceding the first visit, except illness existing on the day of the visit.

In the studies of illness conducted by periodic canvasses of families, "illness" may be considered to include any affection or disturbance of health which persists for a considerable part of one or more days. In this study, as in other family surveys, no specific definition of illness was formulated. The records of "illness" are of sicknesses reported by the household informant (usually the housewife), either as experienced by herself or as she observed them in her family.\* Physical

\* The causes of illness as reported by the family informants were submitted to the attending physician for confirmation or correction. The cause of illness for clinic attendance and hospital admissions were checked against the records of the clinic or hospital where the service was given.

defects or deformities, even though disabling, were excluded from this analysis. Illnesses present in the family at the time of the first visit were recorded, but in this analysis are not considered as illnesses occurring within the period of the study.

*Representativeness of the Sample Population*—The data for this analysis are based upon the experience of all families observed two months or longer during the second year of the morbidity study, that is, the year ending June, 1940. There were 1,757 such families, including both those which moved out or into the study area during the year. In the previous year there was a total of 1,796 families in the morbidity study which were observed two months or longer.

The sample population for the first two years of study was found to be representative of the universe from which it was drawn, the white population of the district, with respect to age constitution and size of household. The

age distribution of the population in the 1,757 families compared with the age distribution of the total white population of the Eastern Health District in 1939 is shown in Table 1. It is readily apparent that there are no important differences between the sample population and the total white population with respect to age content. The average size of white household in that year for the total district, 3.9 persons per household, was only slightly higher than in the sample population, where there were 3.8 persons per household.

*Selection of Chronic Disease Families*—The chronic disease families were selected for special analysis on the basis of the presence of an individual for whom any one of the following conditions or diagnoses was reported: mental disease or mental deficiency, neurasthenia or nervous breakdown, heart disease, hypertension or high blood pressure, arthritis, diabetes, varicose veins, gall-bladder disease, ulcer of the stomach or duodenum, chronic nephritis,

TABLE 2

*Type of Index Case and Other Cases of Chronic Disease in 381 Families in the Eastern Health District of Baltimore, 1939-1940*

Type of Index Case	Total Families	Other Individuals with Chronic Condition Similar to Index Case	In Addition, Other Individuals with Chronic Disease in Family											All Cases in Family
			Heart	Hypertension	Arthritis	Diabetes	Varicose Veins	Syphilis	Ulcer of Stomach	Tuberculosis	Rheumatic Fever	Gall-Bladder	Cancer	
An Individual Who Has Been Diagnosed as:														
Mental Disease or Mental Deficiency	50	9	3	2	1	1	2	..	..	..	..	..	..	68
Neurasthenia	29	1	1	..	..	..	..	1	..	..	..	..	..	32
Heart Disease	62	2	..	5	3	3	..	..	1	1	..	..	..	77
Hypertension	78	6	..	..	5	..	1	..	..	..	2	..	..	92
Arthritis	69	3	..	..	..	..	..	2	..	..	2	1	1	78
Diabetes	24	2	..	..	..	..	1	1	..	..	..	..	..	28
Rheumatic Fever	25	5	..	..	..	..	..	..	..	..	..	..	..	30
Varicose Veins	13	1	..	..	..	..	..	..	..	..	..	..	..	14
Gall-Bladder Dis.	10	0	..	..	..	..	..	..	..	..	..	..	..	10
Tuberculosis	11	0	..	..	..	..	..	..	..	..	..	..	..	11
Syphilis	2	0	..	..	..	..	..	..	..	..	..	..	..	2
Ulcer	4	0	..	..	..	..	..	..	..	..	..	..	..	4
Nephritis—Chronic	3	0	..	..	..	..	..	..	..	..	..	..	..	3
Cancer	1	0	..	..	..	..	..	..	..	..	..	..	..	1
Total	381	29	4	7	9	4	4	4	1	1	4	1	1	450



cancer, rheumatic fever and rheumatic heart disease, tuberculosis, and syphilis. Out of the total 1,757 families observed during the second year of study, 381 or 22 per cent reported one or more individuals with one of these diagnoses.\*

It is recognized that such a group of diseases or conditions is homogeneous in only one respect, their tendency to chronicity. Tuberculosis and syphilis are known to be infectious diseases. Knowledge of the etiology and of the pathology of the remaining conditions listed is incomplete. Since this study is not concerned with the occurrence of secondary cases of chronic disease of like diagnoses in families, for purposes of observation of morbidity among other family members not affected, the experience of the 381 families has been combined.

Table 2 shows the families grouped according to the type of index case, the case which formed the basis of selection of the family. The total number of cases of chronic illness in each group of families is also shown. For some of the chronic diseases the number of families was very small. Families selected because of heart disease, hypertension, arthritis, mental disease and mental deficiency, neurasthenia, rheumatic fever, and diabetes were the most frequent. These families also had cases of chronic disease among members of the family other than the index case. In the total 381 families there were 29 individuals with a diagnosis similar to the index case in the family. There were 40 other individuals with chronic disease unlike the index case. In all, there were 450 cases in the 381 families.

The 381 family units afford two groups of population for study: the 450 chronic disease patients, 425 of which were ambulatory cases; and the

other members of the family with no reported chronic condition. The morbidity which occurred in these two population groups may be compared with the morbidity experience of the individuals in the 1,376 families in which no chronic cases of illness were reported.

The population groups with which this report is particularly concerned may be more clearly described as follows:

- A. 1,376 families with no chronic cases—  
Group 1
- B. 381 families with one or more chronic cases—  
Members of the family with no chronic disease—Group 2  
Members of the family having chronic disease—Group 3

#### CERTAIN CHARACTERISTICS OF OBSERVED FAMILIES

Before a comparison of the morbidity experience of the three population groups is made, it is important to note the differences between the two classes of families with respect to characteristics such as migrant families (those which moved into or out of the study), social class, and age constitution of the population. The 1,376 families in which no chronic disease was reported had a higher proportion of migrant families, that is, families which moved into or out of the study area during the year; 27 per cent of these families moved, compared with 20 per cent of the 381 families. Families not classed as home owners are more apt to move; only 40 per cent of the 381 families lived in rented homes, and 53 per cent of the larger group of families were renters. The average size of the 1,376 households was 3.8 persons per household, compared with 4.2 persons per household in those selected on the basis of a case of chronic disease.

The distribution of each of the two groups of families according to the

\* Chronic conditions such as chronic bronchitis, asthma, and hay fever have not been considered among the selected chronic diseases.

TABLE 3

*Distribution of Two Groups of White Families in the Eastern Health District of Baltimore, According to Occupational Class of Head of Household, 1939-1940*

Occupational Class of Head of Household	1,376 Families	381 Families
Professional	2.8	1.5
Business		
Proprietors	11.8	11.3
Clerks—Salesmen	13.2	16.2
Workers		
Skilled	28.2	28.0
Semi-skilled	31.8	31.1
Unskilled	12.1	11.9
All Classes	100.0	100.0

occupational class of the head of the household is shown in Table 3. Though the 1,376 families had a higher proportion of household heads in the professional class than in the 381 families, approximately 3 per cent in the former group compared with 1.5 per cent in the latter, the number of families in this class was so small that the difference between the two groups is unimportant. The point of greatest interest in the table is the striking similarity between the two groups of families with

respect to occupational class. From 24 to 27 per cent of the heads in each group of families were engaged in some form of business; approximately 60 per cent were classed as skilled or semi-skilled workers, and 12 per cent as unskilled workers.

From Table 4, which shows the distribution of three population groups by broad age groups and excluding children under 5 years of age, it is apparent that there are no important differences with respect to age between Groups 1 and 2, that is, individuals in the 1,376 families, and those in the 381 families who reported no chronic disease. However, when the chronic disease patients are added to the population of the 381 families, there is in this group a considerably greater proportion of older people, 60 years of age and over, than in the 1,376 families.

#### INCIDENCE OF ILLNESS AND MEDICAL CARE

In the following discussion of illness and medical care, confinements as a cause of illness are excluded. Table 5 shows the incidence of attacks of illness and the amount of medical care

TABLE 4

*Age Distribution of Population in Families with No Chronic Disease and in Those with One or More Cases of Chronic Disease, in the Eastern Health District of Baltimore, 1939-1940*

Age Groups	1,376 Families With No Case of Chronic Disease	381 Families With One or More Cases of Chronic Disease *	381 Families With One or More Cases of Chronic Disease (Including the Chronic Cases)
			Per cent
All Ages	100.0	100.0	100.0
5-19	28.0	32.6	25.6
20-39	39.8	35.2	29.5
40-59	25.6	24.6	28.6
60 and Over	6.6	7.6	16.3
Number of Years of Life			
All Ages	3,708	912	1,301
5-19	1,036	297	333
20-39	1,477	321	384
40-59	949	224	372
60 and Over	246	70	212

\* Excluding individuals with chronic disease

for illness among persons reporting no chronic disease in the populations of each of the two groups of families, Groups 1 and 2, and excluding the patients with chronic disease. The cause of illness is shown for two broad classes, respiratory diseases and "all other" illness. Two classes of disabling illness are indicated by "bed illness," which include hospital illness, and "hospital illness" alone. These were illnesses which confined the individual to bed or caused admission to a hospital. Amount of medical care is expressed in terms of private physician visits (home and office) and clinic or dispensary visits.

Group 1 families. The rate of "bed illness" was 37 per cent higher in the Group 2 families and "hospital illness" was 21 per cent higher than was noted in the 1,376 families.

The incidence of medical care was also considerably higher, 34 per cent, for persons in the 381 families than for those in the 1,376 families. There were 1.5 physician visits per person per year for illness of "nonchronic" members of the 381 families compared with 1.2 visits per person for illness in the 1,376 families. The difference in the rates for clinic visits was even greater; the rate for persons in the small group of families was 48 per cent

TABLE 5

*Incidence of Attacks of Illness Among Persons with No Chronic Disease in Two Groups of Families: 381 Families (Index Case One with Chronic Disease) and All Other Families in the Eastern Health District of Baltimore, 1939-1940 \**

Classification of Illness and Medical Care	Group 1 3,708 Years of Life. All Other Families	Group 2 912 Years of Life. Persons in 381 Chronic Families, Excluding Chronic Cases Rate per 1,000 Population	Ratio of the Rate for Group 2 to Rate for Group 1
All Causes of Illness †	1,258	1,550	1.23
Respiratory Diseases	707	840	1.19
All Other Illness	552	711	1.29
Bed Illness	262	359	1.37
Respiratory Diseases	165	216	1.31
All Other Illness	97	143	1.47
Hospital Illness	47	57	1.21
Medical Care			
Physician Visits	1,150	1,541	1.34
Clinic Visits	386	571	1.48
Deaths	5.9	6.6	1.12

\* Includes only individuals 5 years of age or older

† Excluding confinements

The third column of Table 5 shows the ratio of the rate for the Group 2 population (381 families) to the rate for the Group 1 population, persons in the 1,376 families. Persons in the Group 2 population had an annual illness rate of 1,550 per 1,000 which was 23 per cent higher than the rate of 1,258 observed among persons in the

above the rate for those in the 1,376 families.

"Bed illness" and "hospital illness" may be judged as one indication of severity of illness. It is apparent that persons with no known chronic disease who were members of the 381 families suffered severe illness with greater frequency than did persons in

TABLE 6

*Incidence of Illness and Medical Care for 425 Ambulatory Patients with Chronic Disease in the Eastern Health District of Baltimore, 1939-1940 \**

Classification of Illness and Medical Care	Rate per 1,000 Population		Number of Attacks	
	<i>Illness of Nonchronic Nature</i>	<i>Disabling Illness of Chronic Nature</i>	<i>Illness of Nonchronic Nature</i>	<i>Disabling Attacks of Illness of Chronic Nature</i>
All Causes of Illness †	1,853	275	721	107
Respiratory Diseases	895	...	348	...
All Other Illness	959	...	373	...
Bed Illness	414	185	161	72
Respiratory Diseases	224	...	87	...
All Other Illness	190	...	74	...
Hospital Illness	67	41	26	16
Medical Care				
Physician Visits	2,021	612	786	238
Clinic Visits	499	386	194	150

\* Population includes 389 years of life for 425 ambulatory patients with chronic disease. (Four bed patients at home and 21 institutional patients are excluded.)

† Excluding confinements

the larger group of families. The consistency of the excess rate for all classes of illness in the Group 2 population suggests that these individuals constituted a more sickly group than did those of similar age in the 1,376 families.\*

The incidence of attacks of illness of a nonchronic nature for individuals reporting the presence of a chronic disease or condition (the population of Group 3) is of interest at this point. The annual amount of illness for the 425 ambulatory patients 5 years of age or older, representing 389 years of life, is presented in Table 6. The crude rate of illness from all causes was 1,853 per 1,000 population, a considerably higher rate than was noted for either of the other population groups. When this rate is adjusted to the age distribution of the population reporting no chronic disease, it is reduced to 1,800 cases of illness per 1,000 population, a reduction of approximately 3 per cent. Age cannot be considered as an important factor influencing the level of the morbidity for this group of patients.

\* Since the populations of Group 1 and Group 2 are quite homogeneous with respect to age, adjustment of the illness rates for age does not change their level.

The rate of disabling attacks of illness of a chronic nature is shown in the second column of Table 6. Such attacks greatly increase the total rate of bed and hospital illness. For example, the rate of hospital illness is increased from 67 to 108 per 1,000 population per year. On the whole, acute episodes of chronic disease represent severe attacks of illness.

The incidence of medical care which is related to the level of morbidity was also higher for the chronic disease patients than for the other two population groups. Physician visits for illnesses of a nonchronic nature were 2 per person compared with from 1 to 1.5 visits per person in the other two population groups. If medical care for acute attacks of illness of a chronic nature be included, it is apparent that ambulatory patients with chronic disease had considerably more care for illness than did persons in the other populations studied.

It is believed that the illnesses of a nonchronic nature for all three population groups are generally comparable. The excesses in the rates for the chronic disease families are summarized

Ratio of the Rate of Illness for Populations of Groups 2 and 3 to the Rate for Group 1

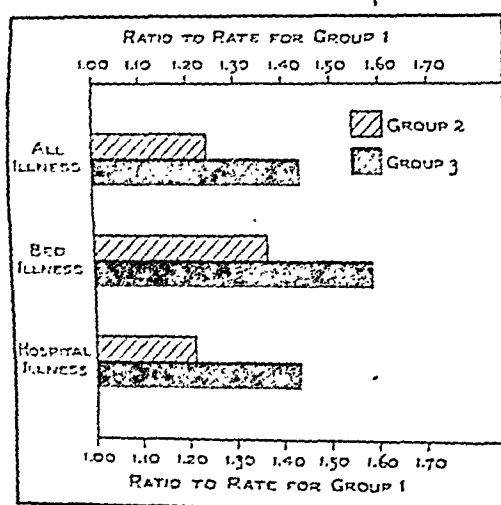


FIGURE 1

in Figure 1 by presenting the ratio of the illness rates in their populations, Groups 2 and 3, to the rate for the remaining families observed during the second year of the morbidity study. It is clearly apparent that the rates for the three classes of illness, all illness (disabling and nondisabling), bed illness, and hospital illness were much higher in the chronic disease families than in the population of the 1,376 families. Among the chronic disease patients, Group 3, the ratios were 1.43, 1.58, and 1.43 for "all illness," "bed illness," and "hospital illness," respectively.

#### ATTENDED CASES OF ILLNESS

In Tables 5 and 6, medical care was expressed in relation to the total population. Medical care may be expressed also in relation to attended cases of illness. These data for illnesses of a nonchronic nature are shown in Figure 2 for each of the three population groups. The mean number of physician visits per attended case varied from 3.5 in Group 1 (the 1,376 families) to slightly more than 4 per case in the 281 chronic disease families. Groups 2

and 3. Clinic visits per clinic attended case were similar for the populations of Groups 1 and 2 with a mean number of visits of 4.7 and 4.9, respectively. Chronic disease patients (Group 3) had fewer visits, an average of 3 clinic visits per case.

It is of interest to show for each population group the proportion of illnesses of a nonchronic nature which had medical care. These data are shown according to classes of illness in Table 7. Although there are some variations among the three population groups in the proportion of attacks which received medical care in the various classes of illness, yet the three groups of population on the whole show a striking similarity. This fact may be clearly seen in Figure 3 where the data are presented graphically. Approximately the same proportion of the total illnesses in each of the three groups had medical care, namely, 33 to 34 per cent. The proportion of bed illness having medical care was also similar for the three groups, from 61 to 66 per cent of the total cases. If attended cases of illness in this particular population, where physicians' care and clinic care for illness is considered to be available to an unusual

Mean Number of Physician and Clinic Visits Per Attended Cases in Three Population Groups

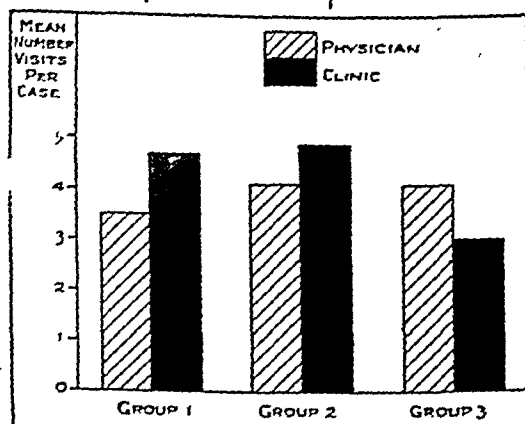


FIGURE 2

## Per Cent of Illness Having Medical Care in Three Population Groups

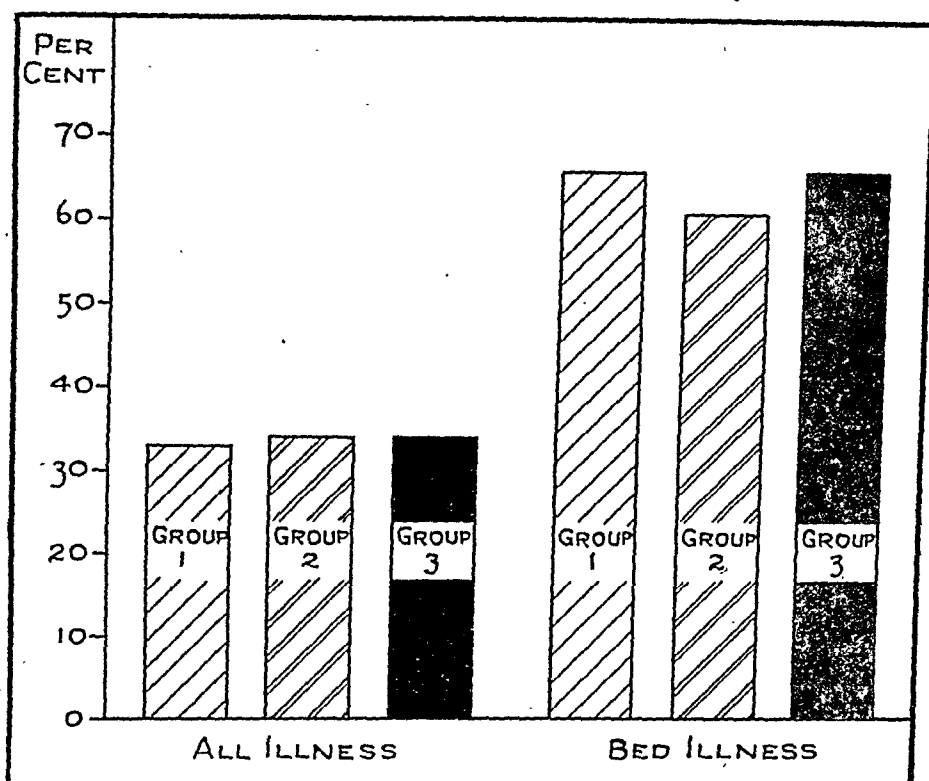


FIGURE 3

degree, may be interpreted as a reliable reflection of severity of illness, the surprising similarity in the three groups of population is of considerable interest. It would seem to indicate that regardless of the level of illness, either bed or all illness, a certain proportion will be severe enough to be thought by the individual to warrant medical care.

Acute episodes of illness of a chronic nature among ambulatory patients did not follow the same pattern as illnesses of a nonchronic nature. Sixty-nine per cent of all attacks of chronic illness and 82 per cent of the bed illnesses had medical care. This again emphasizes the severity of acute manifestations of chronic disease.

Another point of interest is a comparison of the three groups of population with respect to the proportion of

illnesses of a nonchronic nature that were bed illnesses and that were hospital illnesses. These data are presented in Figure 4. Again the three groups show

### Per Cent of Total Illness That Was Bed Illness and Hospital Illness in Three Population Groups

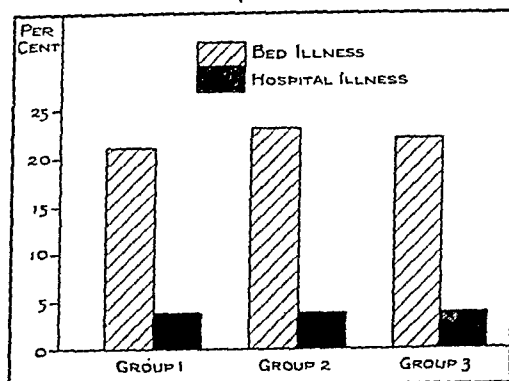


FIGURE 4

TABLE 7

*Per cent of Illnesses Having Medical Care in Three Groups of Population in the Eastern Health District of Baltimore, 1939-1940 \**

Classification of Illness	Group 1	Group 2	Group 3
	1,376 Families	381 Families	Patients with Chronic Disease in the 381 Families
	<i>Per cent Having Medical Care</i>		
All Causes of Illness †	32.5	34.0	33.7
Respiratory Diseases	25.4	26.2	31.3
All Other Illness	41.5	43.2	35.9
Bed Illness	66.5	60.6	66.5
Respiratory Diseases	61.3	57.4	69.0
All Other Illness	75.3	65.4	63.5
	<i>Number of Attacks of Illness</i>		
All Causes of Illness †	4,666	1,414	721
Respiratory Diseases	2,620	766	348
All Other Illness	2,046	648	373
Bed Illness	971	327	161
Respiratory Diseases	610	197	87
All Other Illness	361	130	74
	<i>Number of Attacks Having Medical Care</i>		
All Causes of Illness †	1,515	481	243
Respiratory Diseases	665	201	109
All Other Illness	850	280	134
Bed Illness	646	198	107
Respiratory Diseases	374	113	60
All Other Illness	272	85	47

\* Group 1: Members of 1,376 families in which there were no cases of chronic disease

Group 2: Members of 381 families each with one or more cases of chronic disease, excluding chronic disease patients

Group 3: Chronic disease patients in the 381 families

† Excluding confinements

TABLE 8

*Amount of Medical Care Received by Ambulatory Patients with Chronic Disease in the Eastern Health District of Baltimore, 1939-1940 \**

Type of Care	All Illness †	Rate per 1,000 Population		All Other Care for Chronic Condition
		Acute Illness of Nonchronic Nature	Disabling Attacks of Chronic Illness	
Physician visits	4,396	2,021	612	1,763
Clinic Visits	2,116	499	386	1,231
		<i>Number of Visits</i>		
Physician Visits	1,710	786	238	686
Clinic Visits	823	164	150	479

\* Population includes 389 years of life for 425 patients. (Patients confined to bed or institution throughout the period of observation are excluded.)

† Excluding confinements

very little variation. From 22 per cent of the total illnesses in Group 1, to 26 per cent in the Group 2 population caused the individual to be in bed one or more days. The proportion of the total illnesses which caused hospitaliza-

tion was identical for each of the three groups. It should be emphasized that confinements as a cause of illness have been excluded from all groups of population and, for chronic patients, attacks of illness considered to be due solely to

the chronic disease or condition have also been excluded from the data presented in Figure 4. It is interesting that the proportion of illness of a non-chronic nature which required a period in bed and which required hospitalization was very uniform in the different populations regardless of the level of illness. This can be explained on the basis that the relative excess over the rate for the Group 1 population was approximately the same for these classes of illness and for all illness.

This discussion so far has omitted a presentation of all medical care for the 425 ambulatory patients with chronic disease. In Table 6 medical care for the chronic patients was shown according to two categories—for illness of a non-chronic nature and for attacks of illness due to acute manifestations of the chronic disease itself. Medical care received for the chronic condition during the period when there were no acute episodes was not included. Table 8 presents the total medical care received during a 12 month period by the patients from the 381 families. The rate of physician visits for chronic disease was 2,375 per 1,000 population or slightly more than 2 visits per person per year. The rate of clinic visits was 1,517 per 1,000. This means a total amount of medical care for the chronic condition of approximately 4 visits per person per year. This same population group had an additional 2.5 visits per person for illness of a nonchronic nature. Chronic disease patients had from 3 to 4 times as much medical care for illness as did the other members of their families and the rest of the sample population studied.

Individuals in the 381 chronic disease families formed 26 per cent of the total observed population, had 54 per cent of the total illnesses, and received approximately 50 per cent of the medical care for illness given to the population. Individuals from these families also

constituted almost 40 per cent of the persons hospitalized during the second year of the morbidity study.\*

#### DISCUSSION

From the data presented in this report it is evident that members of families selected on the basis of a case of chronic disease had an excess rate of illness compared with the remaining population. This was true for both chronic disease patients and for other members of the family. No attempt will be made to speculate as to the cause of this difference between groups of families. Some may be inclined to conclude that excess morbidity in these families suggests a concentration in certain families of individuals who through inheritance are less resistant to disease than the remainder of the population. A consideration of factors of the social environment, such as occupational class of the household head and the amount of medical care in relation to the amount of illness aside from chronic disease, revealed no striking differences between the two groups of families. However, there are other environmental factors which have not been a part of this study.

Sydenstricker, in a discussion of health and environment, said: "Diet, as determined by food supplies, dietary habits and economic status, is an important environmental factor in health."<sup>3</sup> Diet is a factor which would not be expected to vary widely as to different members of the family unit. The morbidity study in the Eastern Health District of Baltimore, where the white population is homogeneous with respect to many environmental factors, should offer an unusual opportunity for the study of the relation of nutritional status to illness. Certainly, the influence of this factor upon morbidity must be carefully appraised before an excess of illness in certain family units can be considered

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\* Includes 21 institutional cases.



as proof of inheritance of a constitution of less vigor and vitality.

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## Louisiana Plans New Health Building

THE Louisiana State Board of Health, Baton Rouge, has approved plans for the construction of an office building for the State Board of Health, estimated to cost \$348,000. Included in the structure will be facilities for the central laboratories and office space for all the division and section heads. It is expected that the building will be occupied early in 1943.

New health centers have been approved for Alexandria and Shreveport, to cost about \$100,000. Smaller units have been approved for Leesville, DeRidder, Lake Charles and Lafayette, Crowley, Natchitoches, Winnfield, Marksville, Ville Platte, Glenmora, Lecompte, Colfax, Bunkie, Oakdale, Jena, Fillmore, Plain Dealing, and Elm Grove.

# Use of the Index Case in the Study of Tuberculosis in Williamson County\*

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A SOUND program for the control of tuberculosis must be based on accurate knowledge of the prevalence of the disease and the risk of attack and of death for various classes of the population. To obtain such data for a rural area of Tennessee is one of the major objectives of the Williamson County Tuberculosis Study. Since household associates of cases constitute the most important of the classes at risk, the study program includes the investigation of the families of all cases of tuberculosis, the record of the family since establishment, the examination of the present members, and the continuous observation of these families.

The unit began work with the investigation of the reported cases known to the Williamson County Health Department and recorded deaths from the disease in the preceding 5 years. During the period of the study, the physicians of the county have been very coöperative and have referred known or sus-

pected cases to the clinic for examination. This has been the most productive method of discovery of cases and families for study. The data which are being collected and the methods of collection have been discussed in a previous report.<sup>1</sup>

In the preliminary phases of the study, the problem of developing satisfactory methods for studying the prevalence of the disease and for calculating the risk of attack and of death for the household associates was recognized. It was noted that histories of tuberculosis among siblings, parents, grandparents, and other present or former members of the household were given frequently. Also the disease in the white population was often of an exceptionally chronic nature, sometimes causing no apparent disability. Unknown existing cases of this character were in fact found on examination of the present members. For these reasons the new case or death from tuberculosis which directed attention to the family was frequently found to be secondary to a case or cases of tuberculosis occurring in the past. The families with cases and deaths from the disease in the past without new recent cases were not followed. Therefore, the use of the secondary attack rate as used

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\* Read at a Joint Session of the Vital Statistics and Epidemiology Sections of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 16, 1941. From the Tennessee Department of Public Health. This investigation was made possible by the financial support of the International Health Division, Rockefeller Foundation.

in the study of acute diseases<sup>2</sup> was not believed to be satisfactory. A different method needed to be developed to eliminate such selection of the population and weighting of the group with secondary cases.

The work in the clinic was so organized that the individual who directed attention to the household was usually a case of tuberculosis or a recent death from the disease. Thus the inclusion of this person in the calculation of prevalence rates would necessarily reflect in high rates. To study the findings in families of various classes this case should be excluded so that the results of examination of associates could be compared.

For the calculation of attack and death rates over a period of time the late Dr. W. H. Frost had used a modified life table technic<sup>3</sup> which has proved simple and flexible. However, it is recognized that death rates calculated from past records of families are unusually low. Deaths, especially those of infants, occurring in the past are often omitted. Also the life table experience of established families is known to exclude certain classes of adults who have high mortality rates. Another reason for the low mortality rates for families is the inclusion in the life experience of a living person who directed attention to the family. Naturally this individual cannot be assumed to have been at risk for death, since his survival was essential for the investigation of the family. Also the inclusion of the cases of tuberculosis who directed attention to the family in the life experience during the period of observation would increase the death rate, since persons suffering from the disease are at great risk for death.<sup>4</sup>

Dr. Frost, the consultant of the Tennessee Department of Public Health on Tuberculosis Studies, recognized the need for a relatively simple statistical procedure so that valid comparisons

could be made of the risks in different types of tuberculous families in Tennessee and elsewhere. To make such comparisons it is necessary to designate the person who directed attention to the family and then study the findings among his associates. By this method the defects inherent in the secondary attack rate and the inclusion of the informant can be eliminated. In the memorandum of his visit to Tennessee in June, 1933, Dr. Frost used the term "index case" in referring to the individual known or suspected to be suffering from tuberculosis. The proposed use of the index case is well described in a more extensive memorandum of Dr. Frost dated December 28, 1936, in which he expressed the practical questions with which the health officer is concerned in tuberculosis control:

"Given a case of tuberculosis of designated clinical type brought to the attention of the clinic because of known or suspected tuberculosis (not because of discovery in the course of examination of a known contact)—

"1. What may one expect to find in the household associates of this individual examined at this time with respect to: Frequency of infection as demonstrated by the tuberculin test; frequency of tuberculous lesions of various kinds as demonstrated by physical and x-ray examination?

"2. What may one expect to find in the antecedent history of this household with respect to the rate of occurrence of:

"Manifest tuberculosis,

"Death from tuberculosis,

"Death from other causes?

"3. What may one expect to find in subsequent years with respect to the rate of:

"Occurrence of manifest tuberculosis,

"Mortality from this cause and from other causes?"

Although the antecedent history has provided many interesting problems, this phase of the study has been dealt with rather extensively in a previous publication.<sup>1</sup> The present report will be concerned with (A) the prevalence of tuberculous infection and disease, and (B) the risk for associates during the period of observation.

# A. PREVALENCE OF TUBERCULOUS INFECTION AND DISEASE AMONG ASSOCIATES OF INDEX CASES

In planning the local program of tuberculosis control, the health officer desires to use the most productive methods of case finding. He needs to know the value of examination of household associates of reported cases of tuberculosis. By studying the prevalence of infection and disease among associates of index cases the value of such examinations will be shown.

The results of examination of household associates in white and colored families at the time of investigation are given in Tables 1 and 2.

this report all data collected since the beginning of the study in December, 1931, and up to January 1, 1941, have been included. The household associates of white index cases totalled 2,094, of which 517 were associates of fatal and sputum-positive index cases, and 1,577 of other manifest and latent apical index cases. In the colored families there were 529 associates, of which 339 were associates of fatal and sputum-positive index cases, and 190 of the other group.

While 7.4 per cent of the household associates of fatal and sputum-positive index cases in white families were found to have manifest tuberculosis at the

TABLE 1

*Results of Examinations of Associates in White and Colored Families at the Time of Investigation, According to the Character of Index Case*

Results of Examination	White		Colored	
	Associates of Fatal and Sputum-Positive Index Cases	Associates of Other Manifest and Latent Apical Index Cases	Associates of Fatal and Sputum-Positive Index Cases	Associates of Other Manifest and Latent Apical Index Cases
Total	517	1,577	339	190
Manifest Tuberculosis	38	38	19	2
Latent Apical Tuberculosis	27	36	11	1
Latent Primary Tuberculosis	191	323	106	42
Negative	100	291	102	50
Not Examined	161	889	101	95

The associates have been studied according to the character of the index case—in two groups namely: (1) fatal and manifest sputum-positive, and (2) other manifest and latent apical. In

time of investigation, but 2.4 per cent of the associates of other manifest and latent apical cases were found to have manifest disease. In the colored families, 5.6 per cent of the associates in

TABLE 2

*Percentage Frequency of Tuberculosis of Various Types Among Associates in White and Colored Families at the Time of Investigation According to the Character of Index Case*

Results of Examination	White		Colored	
	Associates of Fatal and Sputum-Positive Index Cases	Associates of Other Manifest and Latent Apical Index Cases	Associates of Fatal and Sputum-Positive Index Cases	Associates of Other Manifest and Latent Apical Index Cases
Total	100.0	100.0	100.0	100.0
Manifest Tuberculosis *	7.4	2.4	5.6	1.1
Latent Apical Tuberculosis †	7.9	5.4	4.7	1.1
Latent Primary Tuberculosis †	55.7	48.5	45.7	44.7
Negative	29.0	43.7	44.0	53.1

\* Percentages are proportions of associates with manifest tuberculosis multiplied by 100.

† Percentages are proportions of persons with latent lesions among those examined (excluding cases of manifest tuberculosis) applied to the percentage of population without manifest disease.

the first group and 1.1 per cent of those in the second group were found to have manifest tuberculosis.\*

Therefore, in a tuberculosis control program emphasis should be given to the examination of household associates of a case known to have tubercle bacilli in the sputum or of a fatal case. The examination of contacts of tuberculosis in less severe stages is not as productive.

This study of the prevalence of tuberculosis among associates of index cases demonstrates the practical value of the use of the index case method to the health officer. The designation of the index case as the case which directed attention to the family is readily comprehended. Data on prevalence of the disease among household associates can be collected and analyzed by many workers.

#### B. THE RISK IN IMMEDIATE FUTURE TO HOUSEHOLD ASSOCIATES OF INDEX CASES

Many important administrative questions can be answered only when the expected future risk for household associates is known. It is necessary to know the approximate number of cases which may occur and when they will probably occur according to the various types of index cases.

With the use of the index case, the risk of attack has been measured in years subsequent to onset of the index case. To the present the published attack rates have included data from histories obtained at the time of first investigation of the household. However, considerable data have been collected for families under current observation in Williamson County.

The experience for associates in white families is shown in Table 3. In all, associates of fatal and sputum-positive index cases have been followed for 2,364.75 person-years and the associates of the other manifest and latent apical cases for 7,122.0 person-years. Eighteen new manifest cases have developed in the first group and 17 in the second group of associates. The case rate for the associates of fatal and sputum-positive index cases of 7.6 per 1,000 person-years was over three times the case rate of 2.4 per 1,000 person-years for associates of other manifest and latent apical cases.

Similar data are shown in Table 4 for the colored families. Among associates of colored fatal and sputum-positive index cases, 27 new manifest cases have developed, which gives the high attack rate of 20.5 per 1,000 person-years or a rate of 2 per cent per year.

TABLE 3

*Cases, Deaths from Tuberculosis and Deaths from All Causes with Rates per 1,000 Person-years Among Associates in White Families During the Period of Observation According to the Character of Index Case*

	Character of Index Case			
	Fatal and Sputum-Positive		Other Manifest and Latent Apical	
	Number	Rate	Number	Rate
Person-Years	2,364.75	....	7,122.0	....
Manifest Cases	18	7.6	17	2.4
Deaths from Tuberculosis	5	2.1	5	0.7
Deaths from All Causes	29	12.3	60	8.4

\* In the present report a criterion for inclusion of associates has been added which was not used in previously published reports; that is, only associates are included who were known to have been in household association with the index case when the index case was known to have the disease.

This is approximately three times the case rate for colored associates of other manifest and latent apical index cases.

The tuberculosis death rate of 16.7

TABLE 4

*Cases, Deaths from Tuberculosis and Deaths from All Causes with Rates per 1,000 Person-years Among Associates in Colored Families During the Period of Observation According to the Character of Index Case*

	Character of Index Case			
	Fatal and Sputum-Positive		Other Manifest and Latent Apical	
	Number	Rate	Number	Rate
Person-Years	1,315.75	....	751.0 <sup>a</sup>	....
Manifest Cases	27	20.5	5	6.7
Deaths from Tuberculosis	22	16.7	2	2.7
Deaths from All Causes	44	33.4	11	14.6

per 1,000, or 1,670 per 100,000 person-years, is extremely high for these associates of the colored fatal and sputum-positive index cases. From these data it is evident that the risk of developing tuberculosis and the risk of dying from the disease is excessive in these colored families.

#### SUMMARY

The use of the index case method permits a valid comparison of the prevalence of the disease and the risk of attack and of death for household associates of cases of designated clinical

types of tuberculosis. From the knowledge obtained through the study of the disease by this method, a sound program can be developed for the control of tuberculosis.

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## Procurement and Assignment Service

THE Procurement and Assignment Service for Physicians, Dentists, and Veterinarians has started its machinery to secure 16,000 physicians and 3,000 dentists for the armed forces

before the end of 1942, without weakening the medical structure for civil and industrial populations as announced by Paul V. McNutt, Chairman of the War Manpower Commission.

# The Connecticut State Department of Health Mental Hygiene Program\*

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THE Connecticut State Department of Health began its work in the field of mental hygiene in February, 1920. The initial interest in a mental hygiene program in the department grew out of a conversation held in 1919 between Dr. John T. Black, then Commissioner of Health, and Dr. William B. Terhune, Medical Director of the Connecticut Society for Mental Hygiene. As a result of this conversation, a Division of Mental Hygiene was created in the Bureau of Preventable Diseases, and Dr. Terhune became the first chief of this Division on a part-time basis.

The work undertaken over the ensuing 21 years has varied in emphasis as well as in quantity. Three more or less distinct periods in the development of the program may be discerned.

The first period lies between 1920 and 1929. During this period there were several different psychiatrists who were part-time chiefs of the division. For short periods a psychologist was also employed part time, and there were similar short intervals in which there was a psychiatric social worker on the staff. During this time, the chief emphasis was on educational work. Hundreds of lectures on mental hygiene were given throughout the state, articles were written, and thousands of pamphlets distributed. Many surveys were

made of psychiatric facilities available, and of community needs. One of the most valuable pieces of work done, was a demonstration of the supervision of parole of state hospital patients by the use of psychiatric social workers. This was shortly taken over by the hospitals and has been maintained since as an integral part of the hospital function. During this period, there were two intervals when a psychologist was employed part time to give mental tests to some 689 children in the county homes.

The second period in the development of the mental hygiene program falls between 1929 and 1935. In 1929, sufficient funds were secured for a full-time chief of the division and for two psychiatric social workers. In 1931, the division was raised to the status of a bureau in the department by legislative enactment. The services of the social workers, or mental hygienists as they are classified in Connecticut, were not maintained throughout the entire period because of reduction in budget as a result of the depression in 1933.

Great emphasis was placed on the educational program, and a large number of lectures were given throughout the state. There were numerous articles and radio talks. Many new pamphlets were bought or prepared and widely distributed. A program of psychiatric clinics for children was inaugurated. These were held in various towns by arrangement, but this type of schedule of clinics did not permit routine fol-

\* Read before the Health Officers Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 14, 1941.

low-up treatment of cases. As a result, these clinics were largely diagnostic. Children were examined, and recommendations left with responsible people in the various communities. Six hundred and nineteen cases were examined during this period.

The third period in the development of the department's mental hygiene program lies between 1935 and the present date. The 1935 general assembly restored the former budget, and in 1936 Social Security Funds became available to augment the staff of the bureau. The major activities during the past 6 years have been: (1) the clinical program, (2) the educational program, (3) participation in the activities of various community organizations, (4) licensure and inspection of the private nervous and mental hospitals, (5) activities in connection with war emergency. These functions will be described individually.

The clinical work of the bureau is by far its major activity. All of the time of the professional staff goes into this work except that of the director, who gives some clinical service. The professional staff at this time consists of 2 psychiatrists, 1 psychologist, and 4 mental hygienists. Funds have been recently appropriated for an additional psychologist.

The clinical program conducted at the present time is an active psychiatric treatment program for children. It was felt that adult clinics were less close to the field of prevention than clinics for children. It was also believed that better results could be obtained with children in terms of the money available, and that a psychiatric program for adults would be better if it were developed in connection with the general hospital and dispensary. An active treatment program for children was instituted because diagnostic clinics had been tried with not too encouraging results. People in the various communities were as a rule not capable of carry-

ing out recommendations left with them after diagnoses had been made. Furthermore, initial enthusiasm for mental hygiene work became stifled upon the realization that the disturbing behavior of the children referred had to be dealt with in spite of attached diagnostic labels.

Psychiatric work with children had developed over a period of years. Under the leadership of the Commonwealth Fund and the National Committee for Mental Hygiene, a practical clinical organization and methods of work had evolved. Such psychiatric clinics for children were, for the most part, known as child guidance clinics. The chief characteristic of these clinics was the utilization of three specialized professions in an integrated attack upon the various behavior and personality problems of children.

The problem of developing such a clinical service in the Bureau of Mental Hygiene resolved itself into one of the distribution of this combined technical service to smaller units of population than could afford or utilize these services on a full-time basis. It is impossible for the smaller communities to secure properly qualified psychiatrists, psychologists, and psychiatric social workers in the proper ratio to one another and for the limited amount of time for which the population has need. Attempts have been made to use one or another of these types of professions to do the whole job. While each can do certain work independently, the chief advantage of the child guidance clinic is lost, namely, the integration of all of these into a clinical attack upon the problem. The use of unqualified or poorly qualified personnel is more wasteful than in almost any other type of work.

The experience of the National Committee for Mental Hygiene had been that a clinical unit could be locally supported and utilized to full capacity



in communities with populations between 200,000 and 300,000. Experience in clinical work with children had shown that 90 to 95 per cent of all children coming to the child guidance clinic could be treated if they could return as often as once a week for treatment interviews, and a considerable proportion of the children required less frequent visits.

With these facts in mind, the bureau organized regular weekly clinics in areas of approximately 50,000 population. To have attempted to serve too large a population in relation to professional time available would have resulted in the treatment service rapidly shifting into diagnosis. The areas chosen were, however, not fixed by geographical boundaries, as this would have raised questions of eligibility for the service based upon residence on one side or the other of an imaginary line. In most rural and semi-rural areas of approximately 50,000 population there is usually a larger or smaller town which serves as the functional center of the population. Shops, recreational facilities, and various community services are found there. Transportation facilities radiate therefrom. The weekly clinics were located at such points in the various areas chosen. Clients might choose which of adjacent centers was personally more convenient. The areas chosen were based on initial interest shown and lack of other comparable facilities within any reasonable distance. Experience has indicated that the majority of children came from a radius of 15 to 20 miles of the clinic center. However, in the past 6 years, 1,900 cases have come from 116 of the 169 towns in the state. This is not to say that the need of these 116 towns have been met. It merely means that only the most urgent cases have been brought from the more remote from the clinic centers. Experience has shown that a psychiatric clinic for children operating on a 1 day

a week basis does, in fact, serve a population of roughly 50,000.

The measurement of the results of such a clinical program is impossible in the terms by which public health people usually measure progress in the prevention of disease. Until the various types of mental disorder are made reportable, and until preventive work is conducted on a much greater scale, any rates showing the effect of such work on the incidence of mental disease are meaningless. Hospitalization rates are affected by too many other and more heavily weighted variables to give any satisfactory answer. Those working with individual cases can make subjective estimates of improvement in the cases seen. These estimates indicate from 60 to 70 per cent of the cases improved. It must be remembered, however, that, though the clinics are operated on a treatment basis, many cases are sent in for diagnosis and recommendations only. This is especially true of dependent and neglected children coming before the court for commitment, to a certain extent for delinquent children, and largely for those crippled children where the orthopedic program to be undertaken hinges upon the psychiatric diagnosis. An indirect way of judging the results of the program is by the demand made by professional and lay organizations for an extension of the service. The amount of such demands, if they could be satisfied by the bureau, would necessitate about five times the present staff.

The bureau has made one attempt to measure the results of its clinical work. A study was undertaken to see what if any savings were effected as a result of the clinical program. All cases during a particular year were reviewed with the idea of determining those for whom institutionalization would have been necessary except for the work of the bureau. During the year chosen, 477 children were seen for diagnosis and treatment. Sixty-six cases were found in

which there was practically no doubt as to probable institutionalization. Commitment proceedings had already been started on 29, plans for commitment had been made by family or agency on 19, and, of the remaining 18, it was the unanimous opinion of the staff that they would have had to go to various institutions. The particular institutions to which these children would have gone was determined, the per capita costs of these institutions obtained, and the average length of stay of patients in the various institutions ascertained. The total probable cost of hospitalizing these 66 cases was then estimated at just short of \$200,000. The expenditure of the bureau for the year was \$28,641.25. If the cost of institutionalization of the children for just this particular year is estimated, it comes to \$43,294. No effort was made to estimate the costs of the other 411 children who presented various behavior, personality, or educational problems, though the greatest number of improved cases belonged in this group.

The educational work of the bureau has been conducted as a part of the general program of public health instruction. In all lectures, articles, and radio talks, the point of view of the psychobiological nature of the individual has been stressed. This orientation fits in easily with any specific health instruction pertaining to the care of the structural aspects of the individual. For professional groups dealing with children, lecture courses have been given which would assist them in their handling of behavior and personality problems. The bureau also distributes a large number of pamphlets. One of these, published by the bureau, has been sold in considerable quantities outside of the state and nation during the past 12 years.

The professional staff of the bureau engages in a variety of activities which may be classified as participation in com-

munity activities. Considerable work is done on various committees, and in many instances this may be of more far-reaching significance than the treatment of any specific case. It is particularly important that when general policies are being established which affect the lives of large numbers of children, the effect of these policies on mental health should be considered. Participation in various professional meetings might be considered a part of the educational program. Various state departments call upon the bureau for advice. The bureau, as a matter of practical necessity, serves as a clearinghouse for all sorts of individual inquiries regarding mental disease, facilities for treatment, legal procedures involved in the care of mental patients, and a host of other services.

In 1935 the General Assembly passed an act requiring that the private mental hospitals obtain a license from the Connecticut State Department of Health, and directing the Public Health Council to establish a sanitary code for their regulation. The duty of inspecting the hospitals and seeing that the regulations were carried out became the responsibility of the Bureau of Mental Hygiene. There are 16 private mental hospitals with approximately 1,200 beds. As a result of this activity, there has been considerable improvement in the plant, general sanitation, and in the medical and nursing care of these institutions. The matter of fire hazard was one of the most urgent problems at the beginning, but all the hospitals very shortly met fire regulations. A very few unsatisfactory hospitals have been eliminated. Various complaints about the hospitals are made from time to time. These are all investigated by the bureau and, where the complaints are warranted, remedial measures initiated.

Since January, 1941, the bureau, like so many organizations, has taken on new duties and responsibilities in con-

nection with national defense. At the request of the Medical Director of the State Selective Service, the bureau set up machinery for checking the names of registrants against various state files where there might be evidence of previous neuropsychiatric disability. Through the coöperation of various state departments and the state hospitals, this central checking process in the bureau was possible.

As of August 1, 1941, some 24,000 names have been checked and 3 per cent of these have been forwarded to the State Selective Service Office for deferment or other disposition. During this period, the director of the bureau has acted as chairman of an advisory psychiatric committee to the Medical Director of Selective Service. This committee has helped to work out procedures for more and better psychiatric examinations of registrants, has initiated an experiment in large scale psychiatric examinations, and planned a section of

the annual meeting of the State Medical Society for local board examiners.

During the recent session of the General Assembly, a State Defense Council was created. Since June, 1941, the director of the bureau has served as a member of the Welfare and Community Activities Committee of the Council. Tentative plans of the Medical Committee of the Council are that, in the event of evacuation of children, the bureau would be responsible for the organization of the psychiatric services needed for an expected 10 or 15 per cent of emotionally disturbed children.

This, then, is a brief summary of the major activities of the Bureau of Mental Hygiene of the Connecticut State Department of Health. The clinical service is the activity requiring the largest amount of professional time. The needs of the state for this service are not yet nearly met. This, we believe, can only be done through the addition of new clinical units.

# The Expanded Rôle of the Sanitarian<sup>\*†</sup>

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IN the field of environmental sanitation in the local health program our concepts of service have undergone a remarkable change in recent years. Our increasing knowledge of the etiology of disease and control of morbid conditions has called for changes of methods and a shifting of emphasis, activities, personnel, and point of view. The attitude of the people in this country toward the responsibility of the government—federal, state, and local—in public health is crystallizing toward a more rational widespread public health program. While it is clear that there is this steadily increasing demand on the part of the public for a more comprehensive program, there is likewise developing a demand for an improvement in the quality of the services rendered. Such factors are having a tremendous influence on the development of the sanitation program and call for an understanding of the rôle the sanitarian shall play in the expanding program of local health service.

In a discussion of the rôle and qualifications of sanitation personnel in the local health program there is generally a divergence of views. It appears that these discussions take two trends; that is; there are those who approach the problem from the theoretical and academic standpoint and those who look

at it from an intensely practical viewpoint. Those who look at this problem from the practical standpoint consider there is a need for the services of the sanitarian in local health service, and where adequate, intelligent, technical administration and supervision are provided either locally or through district or state sources, the rôle and usefulness of such personnel are expanding. Those who feel that only personnel with public health engineering training have a place in the sanitation program of local health departments are inclined to be too theoretical and lose sight of many existing factors which make such a conclusion impracticable, unnecessary, and perhaps unwise.

In considering the utilization of the sanitarian it appears that three conditions are vitally necessary to insure the proper expansion of the sanitation program of the local health department to furnish the technical services our present knowledge will permit and to meet the demands of the public for the type and quality of services they have reason to expect. These conditions are: (1) a clear understanding of the nature and scope of environmental sanitation; (2) a realization of the responsibility for the technical administration and supervision of the sanitation program; and (3) a proper coördination of the services rendered by various types of personnel.

Engineering may be broadly defined as the utilization of materials and forces of nature for the benefit of man. The employment of these materials and

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\* Read before the Southern Branch American Public Health Association at the Tenth Annual Meeting in St. Louis, Mo., November 11, 1941.

† The use of the term "sanitarian" in this paper is intended to apply to sanitation personnel of the essentially local rural health services who do not have public health engineering training and experience.

forces in the adjustment of the environment to man primarily for the protection and promotion of public health has developed into a specialized branch of engineering termed "public health engineering." This branch of engineering, "includes the public health aspects of all types of environmental conditions whose control is based upon engineering principles regardless of the magnitude or technical difficulty of the individual problems involved."<sup>1</sup> The recognition, therefore, "that environmental sanitation problems—whether small or large, simple or complicated—are fundamentally engineering in character"<sup>1</sup> leads to the conclusion that the nature and scope of environmental sanitation requires engineering training in the solution of the problems involved regardless of the qualifications of the personnel who render sanitation services in the field.

In the technical administration of the sanitation program in the local health department it is felt there is not yet as clear a realization by the public health engineer of his responsibility thereto as is his feeling that the problems involved in sanitation are of a public health engineering nature. Furthermore, many health officers do not appreciate the need for engineering training as a prerequisite to proper planning and supervision of sanitation programs. Obviously, unless those in administrative positions realize their responsibility in providing proper technical supervision of these activities the task will be performed by others, presumably less qualified by education and training. Under such conditions those engaged in local sanitation service, whether inexperienced public health engineers or sanitarians, must develop policies and procedures without benefit of the guidance of experienced public health engineers. In discussing the apparent failure of sanitarians in a certain state, an able public health

administrator recently stated in a private communication: "I would naturally expect them (the sanitarians) to fail in that state for the lack of intelligent leadership in the state health department. My experience has demonstrated thoroughly to me that, where a state had an excellent division of public health engineering with constructive leadership interested in improving environmental sanitation, sanitarians had played a most important and necessary rôle." Much confusion now existing in both the administration and performance of the local sanitation program could be eliminated if a proper realization of professional supervision could be established.

In most successful organizations there is a clear understanding of the particular functions of the various persons making up each organization. In each case persons are assigned responsibilities commensurate with their basic training and ability, all performing their allotted tasks under the technical guidance and general supervision of basically qualified individuals. For reasons of economy and efficiency any professional organization must supplement the services of its basically qualified workers by assigning specific functions to sub-professional workers who through training and experience have demonstrated ability to perform such functions efficiently under adequate supervision. Such persons obviously should not be assigned tasks which depend upon professional knowledge and experience they do not possess. Since such procedures find ample justification in various fields of medical and engineering endeavor, are not the same principles applicable to the proper functioning of a local sanitation program? Is it not possible, therefore, for the sanitarian with proper educational qualifications, basic training, and experience to perform specific assignments in the local health program

under specified procedures and adequate professional supervision? If the answer to these questions is in the affirmative, it appears evident that the rôle of the sanitarian has been and will be further expanded.

In trying to determine the degree to which personnel with professional qualifications should be employed for local health service, one is confronted with a number of practical phases of the problem which must be considered. The type and kind of public health engineering problems encountered in the average rural county in the South frequently are not of sufficient magnitude to require individual or independent solution. In such areas a public health engineer is not long satisfied performing chiefly routine services. Also, in these cases, budgetary limitations too often mitigate against the employment of such personnel who would remain for a sufficient length of time to develop a program of full value. Frequent shifting of personnel is not conducive to real accomplishments nor will the public give its best support to the health department which has a constantly changing group of workers. These are considerations which are vitally important in the program of local health service and have a direct bearing on the use of the sanitarian in this service in many areas throughout the South which are predominantly rural.

The recent use of Social Security funds to make available training courses for sanitarians has had a real influence on the quality of persons seeking employment in environmental sanitation. This, together with more rigid qualifications applying to persons seeking entry into this field, has elevated the sanitarian's position to a more useful one than formerly and has expanded his opportunities for service.

The sanitarian's rôle is being further expanded through the broader program

of local sanitation work resulting from better coverage of previously recognized problems and also the appearance of new problems. Examples are the more intensive programs of school sanitation, of food control, and the relatively recent problem of typhus fever control. The type and quality of sanitation service rendered by the progressive local health department today bears but little resemblance to that of a decade or two ago.

There is a growing realization on the part of engineers of state health departments of their responsibility for the proper guidance and supervision of the local sanitation program. This tends toward a broader program in this field and also makes it possible for the local sanitarian to assist with certain difficult and technical activities which formerly have been reserved for state handling. This provision of better technical guidance and supervision is expanding the usefulness of the sanitarian and makes it possible for the local health department to render a more adequate sanitation service to the public than formerly.

With the improvement of the quality of sanitation services there are indications of an increasing interest on the part of the health officer in the duties and responsibilities of the sanitarian. This increasing interest is having its influence on a closer coördination of the activities of the various personnel of the health department which in turn enables the sanitarian further to extend his usefulness.

The progress made in public health work in recent years has greatly expanded the program of the well organized local health department and has demonstrated the value and importance of the sanitarian's activities. This expansion calls for more technical services from the state health department and has clearly shown the need of adequate and integrated supervision. Where

this supervision is not being adequately supplied, the local sanitation program suffers and the sanitarian himself, without this leadership, cannot be as effective in his efforts.

While the sanitation program has been broadening, there has not been, in many cases, a corresponding increase in personnel adequately to handle the work to be done. A deficiency of personnel results in too much superficial effort, spreads services so thin that supervision cannot be efficient, and decidedly limits the effectiveness of the sanitarian. Many failures to produce quality accomplishments in sanitation are due to a lack of sufficient personnel regardless of improvement in the qualifications, energy, and enthusiasm of those involved. The rôle of the sanitarian would be greatly enhanced and the services he is supposed to render would be of much better quality if a more rational method were universally used in determining the number of such personnel required adequately to serve a given population or size and kind of area.

Though there are still many inadequacies in the sanitation service being rendered in different areas of the country, there have been many improvements in the quality of personnel engaged in this endeavor; improvements in technical supervision being rendered to local health services; a broadening of the sanitation program, and correspondingly a greater opportunity for the competent sanitarian to display his rôle of usefulness. There is a constantly increasing interest and demand on the part of the public in regard to improved environmental sanitation, and an apparent, greater interest on the part of the health officer in the rôle the sanitarian should play in the entire public health program. These conditions seem to indicate an expanding rôle for the sanitarian in the type of health program being generally developed in the rural areas throughout the South.

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# Use of Alum-Treated Pertussis Vaccine, and of Alum-Precipitated Combined Pertussis Vaccine and Diphtheria Toxoid, for Active Immunization\*

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THE study of active immunization against pertussis, in Grand Rapids, Mich., has been the subject of several reports.<sup>1, 2, 3</sup> Field Series I, comprising 4,212 children, was the subject of a paper read at the meeting of the American Public Health Association in Kansas City, 1938. The total quantity of vaccine was 70 billion organisms given in four weekly subcutaneous doses of 1, 1.5, 1.5, and 3 ml. respectively, the last amount given in two bilateral injections. The pertussis incidence in the vaccinated group was 2.3 per 100 person-years, in comparison with 15.1 among the unvaccinated controls. The secondary attack rates<sup>3</sup> were calculated for all the susceptible children in the families in which pertussis occurred and found to be 36.4 in the vaccinated group in comparison with 92.0 in the

unvaccinated group, in the age band 1 to 6, inclusive. An indication of what has happened in the series since it was closed for compilation of records in November, 1937, is found in an analysis of pertussis cases reported to the Grand Rapids Health Department. A tabulation of these reported cases was made from the beginning of the study in 1934 through December, 1940, and compared with those cases discovered in the field study. The results are shown in Table 1.

Of 2,074 cases of pertussis reported to the City Health Department during the period of study, 181 were found among the study children of Series I; 8 in the vaccine group, and 173 among the unvaccinated controls. From the close of the study through December 31, 1940, there were 1,353 cases reported to the Health Department of which 117 were found among the study children; 10 in the vaccinated group, and 107 in the control group. The relatively larger difference in the ratio of cases in the test and control groups, when based on those reported than when determined by the field study analysis, is easily explained by the case histories available in the study records. In general, only the clinically typical

\* Read before the Laboratory Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 17, 1941.

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‡ In coöperation with the City Health Department of Grand Rapids, Mich., Dr. C. C. Slemons, Health Officer.



TABLE 1

*Field Series I. Pertussis Cases Among the Children of Study Series I, Which Were Reported to the City Health Department*

<i>Found and Reported Cases of Pertussis</i>	<i>Study Period: Mar. 1, 1934, Through Oct. 31, 1937</i>				<i>After Study: Nov. 1, 1937, Through Dec. 31, 1940</i>			
	<i>Control Group</i>	<i>Vaccine Group</i>	<i>Total</i>	<i>C/V Ratio</i>	<i>Control Group</i>	<i>Vaccine Group</i>	<i>Total</i>	<i>C/V Ratio</i>
Found by regular visiting in study Series I	348	52	400	6.7	Study series terminated			
Reported to City Health Dept. among children of Series I	173	8	181	21.6	107	10	117	10.7
Total reported cases for whole city during same period	...	...	2,074	....	...	...	1,353	....

cases were reported, the milder ones were not.

After completion of Field Series I, which gave good evidence of an immunizing antigen in the vaccine used, it seemed logical to investigate certain problems related to the type of vaccine and dosage schedule from the standpoint both of protection and practicability. In Field Series II, the object was twofold: first, to test the efficacy

of a smaller quantity of vaccine than that used in Series I but given over a longer period of time; and second, to test an alum-precipitated vaccine preliminary to its combined use with diphtheria toxoid in a study of simultaneous immunization against pertussis and diphtheria. In Field Series III, the use of alum-precipitated, combined pertussis vaccine and diphtheria toxoid is being investigated.

## FIELD SERIES II. ALUM-PRECIPIATED COMPARED WITH "STANDARD" PERTUSSIS VACCINE AS AN ACTIVE IMMUNIZING AGENT

### GENERAL PLAN OF INVESTIGATION

The study area, the method of entry and withdrawal of test and control children, the plan for obtaining follow-up information, and the system of records, were all essentially as described for Field Series I.<sup>2</sup>

### *Selection of test and control groups—*

The age group under study was defined as including from 6 months up to but not including the 3rd birthday. The children were presumably susceptible, that is, with a record of neither previous vaccination against pertussis nor an attack of the disease.

As in the first field series, the vaccinated group was made up of children who were brought to the city immunization clinic for pertussis vaccination. The receiving nurse designated the en-

try history blanks alternately for alum and standard vaccine, and the injected children were entered as of the date of last injection. The control children, as in Series I, were designated at random from the city department of health immunization file of preschool children. After the information blanks were received from the clinic for a group of children who had completed their immunization, an approximately equal number of children, within the age group of the study and in the same districts as the injected children, were called on by the nurses for verification of their histories and suitability for inclusion in the study. These children if found to be presumably susceptible were entered as controls as of the date designated. There were only 40 col-

TABLE 2

*Field Series II. Number of Children and Average Experience in Months, According to Reason for Withdrawal from Study*

Reasons for Withdrawal	Number of Children				Average Experience in Months			
	All Groups	Vaccine Groups		Control Group	All Groups	Vaccine Groups		Control Group
		Alum	Standard			Alum	Standard	
All reasons	2,751	655	993	1,103	16.0	18.6	16.1	14.4
End of study	1,533	441	668	424	20.9	22.4	19.4	21.6
Pertussis	158	16	23	119	17.4	17.7	14.1	18.0
Moved	658	188	281	189	9.6	10.0	9.3	9.8
Vaccination of controls	355	...	...	355	7.4	...	...	7.4
Other *	47	10	21	16	6.9	9.5	5.5	7.3

\* Includes 4 deaths from other causes in the control group, and 2 deaths in each of the other groups.

ored children in the whole series and they are tabulated along with the others.

*Period of observation*—The study period for the series extended from January 1, 1938, through December, 1940. The period of observation for any particular child was the number of months from entry to withdrawal. A record was terminated for any of the following reasons: attack of pertussis; moved out of study area; vaccination of control; death; a few miscellaneous reasons, such as lack of coöperation; and, finally, close of study December 31, 1940, for compilation of records and analysis. The numbers of children withdrawn for various reasons in the vaccinated and control groups, and the average experience per child in each group, are shown in Table 2.

*Comparison of vaccinated and control groups*—It is well recognized as pointed out by Bell<sup>5</sup> that it is impossible to

select identical study groups, and that, even if it were possible to make all attributes identical at the moment of selection, they would not remain so. An effort was made, however, as previously described, to obtain reasonably comparable groups by designating in the control group presumably susceptible children of the same age and geographical distribution as the vaccinated children. In Table 3 a comparison is given of several factors which seem to have some obvious relation to comparability between groups.

The standard vaccine and control groups are seen to be approximately the same size. The alum vaccine group, according to method of choosing children for vaccination, should be the same as the standard. The reason for its smaller size is to be found largely in the shortage of alum vaccine supply at one period in the study, at which time the injections were continued with

TABLE 3

*Field Series II. Comparison of Vaccine and Control Groups with Respect to Factors Related to Selection*

	All Groups	Vaccine Groups		Control Group
		Alum	Standard	
(a) Number of children	2,751	655	993	1,103
(b) Mean length of experience in months	16.0	18.6	16.1	14.4
(c) Mean age at entry in months	14.0	13.7	13.8	14.4
(d) Males per 100 females	111	107	114	111
(e) Average interval between nursing visits	2.7	2.7	2.8	2.6
(f) Per cent attacked by measles, scarlet fever, and chicken pox	8.1	6.4	8.1	9.1
(g) Upper respiratory infections other than pertussis, per 100 person-years	42.8	45.9	42.0	41.4

standard vaccine. The records of children who received both types of vaccine were eliminated from the analysis.

The somewhat shorter average experience of the control children in comparison with vaccinated children is explained by the withdrawal of many because of pertussis vaccination. There is no real difference in the mean age of the groups, in the sex ratio, or in the average interval between nursing visits. Finally, the incidence of scarlet fever, measles, and chicken pox, as well as the relative frequency of upper respiratory infections other than pertussis, indicates that the opportunity for exposure to some of the common childhood diseases was approximately the same in the vaccinated and control groups. The differences are within the limits of sampling variation.

A comparison of the number of three-person families, that is, of families in which it may be assumed there is only one child, suggests some difference between the vaccinated and control groups. Of the families with vaccinated children, 47 per cent were three-person families in comparison with 20 per cent of the families of the control children.

#### VACCINE USED \*

*"Standard" pertussis vaccine*—The term "standard" vaccine is applied to the type of product used in Series I,<sup>2</sup> since the results obtained with it form the basis for comparison with the results of subsequent study series. This vaccine was a 10 billion per ml. suspension in saline of *Hemophilus pertussis* organisms with smooth characteristics, as indicated by tests just previous to their use. The killing agent was merthiolate.

*Alum-precipitated vaccine*—A suspen-

sion of *Hemophilus pertussis* was prepared just as for the standard vaccine used in Series I.<sup>2</sup> It was then precipitated with alum, essentially as described by Harrison, Franklin, and Bell,<sup>4</sup> and by Bell,<sup>5</sup> by the addition of 1 per cent potassium alum in the presence of 0.27 per cent sodium bicarbonate.

A point worthy of comment is the ease and speed with which the precipitated vaccine shakes into a homogeneous suspension.

*Dosage schedule*—A total of 3 ml. of vaccine was given in 3 subcutaneous injections of 1 ml. each, alternately in the two arms, with an interval of 1 week between the first and second, and an interval of 4 weeks between the second and third injections.

*Immediate reactions to the injections*—The immediate reactions after injection of the standard vaccine in this series were of no consequence. In general, there was a slight local reaction, with the formation of subcutaneous nodules which often persisted for several weeks. Following the injection of alum vaccine, the subcutaneous nodules were a little more marked. In one instance, a sterile abscess occurred. Bell<sup>5</sup> observed that such a reaction may be associated with a too superficial injection.

#### DEFINITIONS WITH RESPECT TO DIAGNOSIS, SEVERITY OF ATTACK, AND EXPOSURE

The same definitions were used for Series II as for Series I. Primarily, the diagnosis of pertussis in study children and in source cases was based upon a detailed case history taken by the nurse. All available supplementary information was used in making the final decision, such as the judgment of the attending physician or members of the health department, cough plate findings, and records of exposure. An attack was considered *moderate* if the child had characteristic whooping and

\* The vaccine was prepared in the Biologic Products Division of the Michigan Department of Health Laboratories. J. T. Tripp, Associate Director.

vomiting, an uncomplicated disease duration of approximately 4 to 6 weeks, and no evidence of marked interference with nutrition. In a *severe* attack the paroxysms of coughing and whooping were unusually severe and frequent, there was marked loss in weight or complications such as bronchopneumonia or prolonged bronchitis. The *mild* attack had only occasional whooping or vomiting, no obvious interference with nutrition, and usually lasted no more than 4 weeks. Under *very mild* attacks were included coughs of not more than 3 weeks' duration in which characteristic symptoms were absent and the diagnosis depended upon either a record of definite exposure or positive cough plate findings. The average interval between onset of attack and the first visit for obtaining the history was 1.8 months. Over 82 per cent of the histories were secured within 2½ months after onset of first symptoms.

Exposures in this report are tabulated as occurring in own household or outside of own household; that is, familial and community exposures, respectively. Each recorded exposure is based upon exposure to a source case in which the diagnosis was established on the basis of a written case history and under the same criteria used for the attacks among the study children. Exposure must have occurred within 3 weeks of the onset date of the source case, and a particular attack was related to a source case only if it occurred within an arbitrarily designated period of 30 days after onset of the source

case; that is, the onset date of the attack must be within 51 days of the onset of the source case.

#### RESULTS OF FIELD SERIES II

*Pertussis incidence in vaccinated and control groups*—In Table 4 is shown the pertussis incidence in terms of attacks per 100 person-years for alum and standard vaccine groups, and control groups.

Of the total 158 pertussis attacks which occurred in the whole series, 1.6, 1.8, and 9.0 attacks per 100 person-years occurred in alum, standard, and control groups, respectively.

In comparing each of the vaccinated groups with the control group, the difference obviously is significant. Comparing the two vaccinated groups, the difference is not significant.

*Comparison of incidence in Field Series II with incidence in Series I*—While it is not possible to compare directly the incidence in Series II with the previously reported Series I, it seems possible to make a reasonable comparison through the medium of the control groups. The attacks per 100 person-years in the control groups of Series I and II were 15.1 and 9.0, respectively. If it can be assumed that these rates give a fair indication of normal expectancy within the study groups, the expected incidence in the vaccinated groups of Series II, if the results were similar to those of Series I, can be derived by a simple proportion, since the incidence in the vaccine group in Series I is known to be 2.3. By this

TABLE 4

*Field Series II. Incidence of Pertussis in Vaccinated and Control Groups, Based on Period at Risk*

	All Groups	Vaccine Groups		Control Group
		Alum	Standard	
Number of children	2,751	655	993	1,103
Person-months experience	43,659	12,142	15,596	15,921
Number of attacks	158	16	23	119
Attacks per 100 person-years	4.3	1.6	1.8	9.0

TABLE 5

*Field Series II. Severity of Pertussis Attacks in Vaccinated and Control Groups*

Severity Rating	Vaccine Groups							
	All Groups		Vaccine Groups				Control Group	
	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
All attacks	158	100	16	100	23	100	119	100
Very mild	24	15	7	44	7	31	10	8
Mild	47	30	9	56	9	39	29	24
Moderate	71	45	..	..	6	26	65	55
Severe	16	10	..	..	1	4	15	13

means, the expected number of attacks per 100 person-years in the vaccinated group is calculated to be 1.4. The actual incidence in the alum group was 1.6 and in the standard group, 1.8. In relation to the amount of experience, the difference between the expected and actual incidence is not significant with respect to either alum or standard group. This suggests that both the alum and standard vaccines in a total dosage of 30 billion organisms over a period of 5 weeks may be as effective as standard vaccine, 70 billion organisms, given over a period of 3 weeks.

*Severity of attack*—As pointed out repeatedly, the rating of the severity of pertussis is rough at best. Every effort was made to avoid bias and to use the same criteria, already outlined, for rating the attacks among vaccinated and control children. It was not possible, however, in many instances to avoid information on the part of the visiting nurse as to whether the patient had had vaccine injections. During the relatively frequent visits, such information was apt to be proffered by the mother.

As found also in Series I, the pertussis attacks in Series II were relatively milder in the vaccinated than in the control children. This is shown in Table 5.

The tabulation indicates further that there was a tendency toward even milder attacks in the alum group in comparison with the standard. It is

seen that 100 per cent of the attacks in the alum group were mild or very mild, in comparison with 70 per cent in the standard group and 32 per cent among the controls. A tabulation of severity and mean age gave no explanation of the difference in severity in the vaccinated and control groups. It is pointed out that the numbers of attacks in the vaccinated groups are small and the comparison therefore is considered only as suggestive.

*Attacks of pertussis related to exposures*—Exposure information was obtained in connection with the regularly scheduled nursing visits so that some of the exposures were recorded before the diagnosis of the attack which may have followed. Other exposures were recorded during the visits for obtaining the case histories on suspected attacks of pertussis.

There were no known exposures, that is; exposures sufficiently well defined to be accepted as such according to the definitions, among 2,751 of the children. Of the remaining 175 children with known recorded exposures, 50 were in the alum group, 52 in the standard, and 73 in the control group. Per hundred person-years experience there were 4.4 known recorded exposures among all vaccinated children and 5.5 among controls. A correlation of exposures with subsequent attacks is shown in Table 6.

Of the children without acceptable records of exposure, 1 per cent contracted pertussis in the alum group, 1

TABLE 6

Field Series II. Proportion of Children Attacked in Relation to Their Exposure Records

Record with Respect to Exposure	Alum Vaccine Group			Standard Vaccine Group			Control Group		
	Number of Children	Children Attacked		Number of Children	Children Attacked		Number of Children	Children Attacked	
		Number	Per cent		Number	Per cent		Number	Per cent
All records	655	16	2.4	993	23	2.3	1,103	119	10.8
No known exposures	605	5	0.8	941	8	0.9	1,028	52	5.1
All known exposures	50	11	22.0	52	15	28.8	73	65	89.0
Exposed in own household	17	7	41.2*	18	9	50.0*	54	53	98.1*
Exposed outside of own household	33	4	12.1	34	6	17.6	19	12	63.2

\* Secondary attack rates.

per cent in the standard, and 5 per cent in the control group. Of the children with accepted records of exposure, 22 per cent in the alum group contracted pertussis, 29 per cent in the standard, and 89 per cent in the control group. Following exposure in own household, 41 per cent were attacked in the alum group, 50 per cent in the standard, and 98 per cent in the control group. The number of attacks is relatively small, and the larger percentage following exposure in the standard compared with the alum group is not significant.

*Secondary attack rates*—Since by definition all the susceptible children of a particular age band in the study families were entered in the study, the

secondary attack rates for the vaccinated and control groups are identical with the proportions of children attacked following exposure in their own households, just referred to in connection with Table 6.

## SUMMARY OF RESULTS OF SERIES II

The data of Series II indicate protection of a large proportion of children injected with alum-precipitated pertussis vaccine in a total dosage of 30 billion organisms, given over a period of 5 weeks.

The results in no way contraindicate the use of alum vaccine, and form a basis for its trial in combination with diphtheria toxoid.

### FIELD SERIES III. ALUM-PRECIPIATED COMBINED PERTUSSIS VACCINE AND DIPHTHERIA TOXOID FOR ACTIVE IMMUNIZATION

The use of several immunizing antigens simultaneously is not new. Even in the injection of a single strain vaccine we know we are introducing several separate antigens, and each will stimulate its own antibody. Experimentally in laboratory animals, many known antigens have been mixed for injection and each found to produce an individual antigenic stimulus. The most familiar example of mixed antigens for human immunization is triple

typhoid, paratyphoid A and B vaccine. Smallpox vaccine frequently is given at the time of last injection of diphtheria toxoid although not mixed with it. Recently, combined diphtheria and tetanus toxoid has been used, apparently with success.

With the multiplicity of accepted immunization procedures for children it is logical that appropriate combinations of antigens for active immunization be studied in order to reduce the number

of required injections, thereby lessening discomfort for the child and family, and simplifying administrative procedure. A number of workers have recognized that simultaneous immunization against diphtheria and pertussis would be a particularly desirable and reasonable procedure if its effectiveness could be demonstrated. Bordet,<sup>6</sup> in 1936 announced that he and Ramon had plans for studying the use of such a product.

Since the findings of Series II in no way contraindicated the use of alum pertussis vaccine, it was considered safe and reasonable to test an alum-precipitated, combined pertussis vaccine and diphtheria toxoid. A study group was started January 1, 1940, in comparison with a standard vaccine group and a control group. These three groups comprise Field Series III, the subject of a previous preliminary report by the author,<sup>13</sup> and of this interim report. Except for the substitution of alum-precipitated combined diphtheria toxoid and pertussis vaccine for the alum-precipitated pertussis vaccine, the methods of procedure were the same in all respects as for Series II.

#### THE COMBINED ANTIGENS \*

*Preparation of vaccine*—*H. pertussis* cultures were grown and harvested as for standard vaccine, and the merthiolate-killed packed organisms suspended in crude diphtheria toxoid to make a final count of 10 billion organisms per ml. This mixture was precipitated by the addition of sterile potassium alum solution in amounts which ranged between 1.5 and 2.0 per cent. In each case, the exact amount of alum required for maximum precipitation was determined by preliminary titrations of aliquots with varying amounts of alum. The calculated amount of alum was

added to the bulk and the precipitate washed twice with saline, and brought back to the original volume with saline and the final product preserved with merthiolate 1:10,000.

The usual sterility, safety, and potency tests for diphtheria toxoid and for pertussis vaccine, respectively, were done before release of the product. Each ml. of the final antigen contained 10 billion *H. pertussis* organisms and the amount of diphtheria toxoid which on antigenic test would produce more than two units of antitoxin in guinea pigs.

*Dosage schedule*—Just as in Series II, three injections were given, with an interval of 1 week between the first and second injections and 4 weeks between the second and third. The first dose was 1 ml. of "standard" pertussis vaccine, and the second and third were each 1 ml. of the combined antigen. This provided the same dosage of pertussis vaccine as used for Series II, and the dosage of alum-precipitated diphtheria toxoid which is recommended by the Michigan Department of Health.

*Immediate reactions*—The immediate reactions, in general, resemble those which follow the injection of alum-precipitated pertussis vaccine or alum-precipitated diphtheria toxoid. Records on local and general reactions were obtained on more than 900 children by nurses' visits the day after injection, and further visits if indicated. Reactions were recorded as none, slight, moderate, or marked, according to a predesignated code. Marked local reactions were based upon an intensely sore area of 2 or more inches in diameter. A marked general reaction was defined to include such symptoms as vomiting, or high fever. As recorded, the majority of reactions were none or slight; only a few were marked. In three known instances, a sterile abscess occurred. Under Series II in this paper, reference has been made to the observation of Bell<sup>5</sup> in this connection.

\* The combined antigen was prepared by the Biologic Products Division, Michigan Department of Health. A separate communication will be made on the details of technic.

TABLE 7

*Field Series III. Diphtheria Antitoxin Titrations in Children Before and After Immunization with Alum-Precipitated Combined Diphtheria Toxoid and Pertussis Vaccine:  
Number and Per cent at Various Antitoxin Levels*

Time of Test in Relation to Time of Injection											
Number of Diphtheria Antitoxin Units	Group A (6) Before, Only	Group B (19) Before and Once After			Group C (9) Before and Twice After			Group D (111) Once After, Only		All Children (145) All Tests	
		Before	5-8		Before	5-8		5-8	11-14	Before	After
			Mo.	Mo.		Mo.	Mo.				
			Number								
Under 0.001	6	19	0	0	9	0	0	0	0	34	0
0.001-0.01 *	..	..	1	0	..	0	0	1	0	..	2
0.01 -0.1	..	..	3	3	..	0	0	7	11	..	24
0.1 -0.2	..	..	1	4	..	2	1	8	13	..	29
0.2 -1.0	..	..	6	1	..	7	7	19	31	..	71
1.0 and over	..	..	0	0	..	0	1	5	16	..	22
All tests	6	19	11	8	9	9	9	40	71	34	148
Per cent											
Under 0.001	100	100	0.0	0.0	100	0.0	0.0	0.0	0.0	100	0.0
0.001-0.01	...	...	9.1	0.0	...	0.0	0.0	2.5	0.0	...	1.4
0.01 -0.1	...	...	27.3	37.5	...	0.0	0.0	17.5	15.5	...	16.2
0.1 -0.2	...	...	9.1	50.0	...	22.2	11.1	20.0	18.3	...	19.6
0.2 -1.0	...	...	54.5	12.5	...	77.8	77.8	47.5	43.7	...	47.9
1.0 and over	...	...	0.0	0.0	...	0.0	11.1	12.5	22.5	...	14.9

\* Note: 0.001-0.01 means up to but not including 0.01.

TABLE 7A

*Cumulative Results of Diphtheria Antitoxin Titrations Before and After Combined Pertussis-Diphtheria Immunization: Derived from Table 7*

Number of Antitoxin Units	Before Immunization		5 to 20 Months After Immunization	
	No.	Per cent	No.	Per cent
Under 0.001	34	100.0	..	....
0.001 or more	..	....	148	100.0
0.01 or more	..	....	146	98.6
0.1 or more	..	....	122	82.4
0.2 or more	..	....	93	62.8
1.0 or more	..	....	22	14.9

#### IMMUNE RESPONSE OF THE INJECTED CHILDREN

*Diphtheria antitoxin*—As a criterion of antitoxic level, titrations\* were done by the method of Fraser<sup>7</sup> in which mixtures of varying amounts of serum and constant amounts of toxin were tested for neutralization by skin injections in the rabbit. Tests were compared with controls on the same rabbit, in which

known amounts of antitoxin and toxin were used. Schick tests of the children prior to immunization have been avoided since they would complicate the interpretation of antigenic response to the combined antigen, due to the antigen in the Schick test material. Titrations have been made with the sera from 34 children before, and from 148 after injection of the combined antigen. The children were selected on the basis of ease of bleeding. The results are shown in Table 7, and cumulated in 7A.

\* Diphtheria antitoxin titrations were made by the Biologic Products Division, Michigan Department of Health.



None of the children tested before immunization had as much as 0.001 unit of antitoxin and every one of those tested 5 to 20 months after immunization had at least that amount. As the tabulation indicates, 98.6 per cent of them had a level of 0.01 unit or more, and 82.4 per cent, a level of 0.1 or more. It is of interest to compare these levels with those obtained by Volk and Bunney<sup>8</sup> in the Saginaw County, Mich., study. The determinations in both series were done in the same laboratory. In the age group from 2 to 5 years, 4 months after injection of two doses of alum-precipitated diphtheria toxoid, 97 per cent of the children had at least 0.01 unit, and 53 per cent at least 0.1 unit; at 12 months, the respective proportions at these two levels were 93 and 51 per cent. It should be pointed out that these authors were dealing with rural children, while the children in this study were largely urban. The results indicate that after injection with the combined antigen, the antitoxin reaches fully as high levels as after injection with an equivalent amount of alum-precipitated toxoid given alone.

*Pertussis antibodies*—As a criterion of response to the pertussis antigen the opsonocytophagic test as reported by Kendrick, Gibbs, and Sprick<sup>9</sup> was used. In addition, some complement-fixation tests and agglutination tests were done. A total of 545 opsonic tests before and 311 tests after immunization are summarized in Table 8.

Of the opsonic reactions before immunization 99.3 per cent were negative or weak; 4½ to 14 months following immunization 79.7 per cent had reactions at least moderately strong, a reaction considered to indicate a significant antigenic response. Of these tests, 180 were on the same children before and after immunization, and the results were in line with those for the whole group, as recorded in Table 8.

Of 27 children tested by the complement-fixation method before injection, the reactions were negative in 26, and doubtful in 1. Six months to 1 year after immunization, 135 were tested; 105 were positive, 5 doubtful, and 15 negative.

Agglutination tests were done on 62 children from 6 to 15 months after completion of immunization and the titers were as follows: 5 were negative in 1:10 dilution; 9 had a titer of 1:10; 35 had titers 1:20 through 1:100; 13 had titers 1:250 or higher.

The results of the complement-fixation and agglutination tests indicate good response to the pertussis antigen.

#### INTERIM TABULATION OF RESULTS RELATED TO PROTECTION

During the period from the beginning of Series III on January 1, 1940, through September 30, 1941, the study series has come to include 2,194 children of whom 847 were injected with combined, and 380 with standard vaccine, and 967 were unvaccinated controls. The experience and incidence in

TABLE 8

*Field Series III. Opsonocytophagic Tests with Pertussis Antigen Before and After Immunization with Combined Diphtheria Toxoid and Pertussis Vaccine*

Time of Tests with Respect to Completion of Immunization	Number of Children	Per cent of Children with Opsonic Reaction	
		Negative to Weak	Moderately Strong or Strong
Before immunization	545	99.3	0.7
After immunization	311	20.3	79.7
4½ to 5½ months	38	13.2	86.8
6 to 8 months	179	20.7	79.3
11 to 14 months	94	22.3	77.7

NOTE: Of these tests, 180 were on the same children before and after immunization.

TABLE 9

*Field Series III. Alum-Precipitated Combined Diphtheria Toxoid and Pertussis Vaccine: Interim Tabulation of Pertussis Incidence in Test and Control Groups*

<i>Time at Risk and Attacks</i>	<i>All Groups</i>	<i>Vaccine Groups</i>		<i>Control Group</i>
		<i>Combined</i>	<i>Standard</i>	
Number of children	2,194	847	380	967
Person-years	1,536	610	386	540
Attacks	69	4	6	59
Attacks per 100 person-years	4.5	0.7	1.6	10.9

terms of attacks per 100 person-years are indicated in Table 9.

The children in this Series III are still under observation, additions are being made from week to week, and a final conclusion regarding protection is not being drawn. In this interim report, however, the incidence of 10.9 in the control group and of 1.6 in the standard vaccine group closely parallel the findings of 9.0 and 1.8, respectively, for Series II. Reason for particular encouragement is found in the low incidence of 0.7 for the combined vaccine group.

#### SUMMARY OF THE RESULTS OF SERIES III

Titration of diphtheria antitoxin levels before and after injection indicate a good response to the toxoid in the alum-precipitated, combined pertussis vaccine and diphtheria toxoid, as to diphtheria toxoid alone. Also, opsonocytaphagic as well as complement-fixation and agglutination tests, indicate that pertussis antibodies are stimulated by the pertussis vaccine.

An interim tabulation of incidence indicates 0.7 attack per 100 person-years in the combined vaccine group in comparison with 1.6 in the standard vaccine group, and 10.9 in the control group.

#### COMMENT

The question of dosage in relation to pertussis vaccination has received considerable discussion in various articles during the past several years. There is no experimental basis at pres-

ent for saying that one or another schedule is optimum. It can only be said that with a particular procedure, the results were as found. There has been a tendency on the part of some workers to increase the total dosage as an answer to incomplete protection in any study series, and heavier suspensions such as "double strength" vaccine are in use. The total amount undoubtedly is important, but investigations should cover more thoroughly the other phases of the problem: the type of vaccine, the number of injections and the period over which they are given, and the several questions associated with secondary stimulus. In view of inconclusive data as to the duration of immunity it would seem reasonable to study the advisability of re-immunization just before the child goes to school. Limited experience suggests that a single, relatively small injection may provide an adequate secondary stimulus.

In the study of *total dosage*, the desirability of giving no more than is required for a good degree of protection should be recognized. Investigations of the *type of vaccine* must take into consideration the possible value of toxic products of the pertussis organism as immunizing agents, in the light of the work of Evans<sup>10</sup> and others. Also, the possibility should be explored further of *combining* the pertussis antigen with other antigens, such as diphtheria toxoid. On the subject of *interval* between injections, Faber,<sup>11</sup> Maclean,<sup>12</sup> and others, have called at-

tention to its possible importance. Bell,<sup>5</sup> in his recent study of alum-precipitated pertussis vaccine used a 4 week interval between two injections. His results as well as those included in this paper suggest that the subject can be investigated further with profit. Field Series III in Grand Rapids, for which an interim report is made, is expected to throw more light on several phases of the problem as more experience is accumulated with a dosage schedule of 30 billion organisms given over a period of 5 weeks.

#### GENERAL SUMMARY AND CONCLUSIONS

The results indicate a good degree of protection against pertussis, following a dosage schedule of 30 billion organisms distributed in 3 injections over a period of 5 weeks. Also, the results appear similar to those in a previous series in which 70 billion organisms were injected over a period of 3 weeks. These observations suggest that the period over which the vaccine is administered should receive as much consideration as the total dosage.

Following the use of alum-precipitated, combined pertussis vaccine and diphtheria toxoid, good antigenic response to both the pertussis antigen and diphtheria toxoid was demonstrated by immunological tests. An interim tabulation on incidence indicates protection against pertussis following injection of the combined antigen.

A more definite conclusion on protection as well as on the question of an adequate dosage schedule awaits further observation.

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# Public Health as an Important Part of Pan American Defense\*

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IT would seem that there had almost been deliberate forethought in the selection as our meeting place of this beautiful spot called Atlantic City. Both its name and its geographical location bring to mind and to view the great ocean which is the most powerful ally in America's defense, and which at the same time links us with the English people across its waters who, in defending so valiantly their own liberties, serve as a strong bulwark in defense of our independence.

When we are attacked individually, we defend our own lives: individual survival is the basis of this defense. If our families are threatened, we rush to their defense and disregard our own safety; our survival loses its value for us if our families are in danger of being injured or destroyed.

When our country is in peril, we forget even our family duties; we bring or send our sons to the zones of greatest danger and abandon the rest of our families to their own resources. And why? Because, fellow citizens of the American Republics and of the democracies of the world, without liberty and independence for our countries, there is no possibility of happiness either for families or for individuals.

Today we have an even greater duty; we are called upon for an even greater patriotism—for us in the Americas, a continental patriotism, or

"American continentalism"; for all believers in democracy in the world, a common concept of liberalism, using the word in the sense of the defense of liberty. Without these qualities, continentalism and liberalism, which must be safeguarded at all cost, there is no possibility of decent living, whether for nations, families or individuals.

This great New World commonwealth of ours, this union of free peoples which here in America had its cradle and has its home, is the one which we must all of us defend, forgetting for the present all other interests, loyalties, and egotisms, so that we may the better preserve them for all time. The peoples of the Americas may have their differences in points of view and even in interests; the political parties of each of our countries may also hold varying opinions and follow different courses for the solution of their problems; the followers of each party and the citizens of each nation may evaluate in their own fashion the conduct of the public officials of their own countries, but today no citizen of any country, no partizan of any party, no party in any nation, and no nation on this continent, can have any other desire than to preserve the rights of liberty, political independence and voluntary confederation, based on the great principle of self-determination, which was won by our forefathers with such long and bloody sacrifice, and which we today enjoy as our inheri-

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tance. These rights are the foundations of our happiness and of the future of the world, and we Americans have the high duty of safeguarding them and of thus assuring the constant progress of civilization.

Nor can we differ in our decision to undergo the greatest sacrifices, to run the greatest risks, even to submit voluntarily to discipline at the temporary cost of our liberty of thought, speech, or action, in order to secure the coördinated and farsighted effort necessary for victory.

When the founders of our various countries proclaimed the rights of liberty which they had to defend by arms, their first act on enlisting in the liberating armies was to renounce all personal interest and ambition, however legitimate, and even their duties toward their families. Still more, they also renounced for the time being the very absolute liberty which they were defending, in order to permit the disciplined organization of the armies of their free peoples. The free peoples of America, in their democratic union of nations in a coöperative effort to defend liberty for their own sakes and for other peoples, must imitate those who, in proclaiming liberty and independence, knew how to adapt these same principles to discipline and interdependence during the struggle for freedom. The victory of democracy will come soon, and at less cost, if we delay no longer in creating an efficient, practical Pan American coöperation.

In the past, union made possible the beginnings of American liberty; the maintenance of unity created the American strength; the attainment of closer unity will successfully defend the liberty of America, and of the world.

As we offer the coöperation of public health to the defense of liberty, we do not forget that the victory of America in behalf of Cuban liberty permitted the consolidation of knowledge and

sanitary measures which have made possible the security of life and the advance of civilization and progress in the American tropics.

Recently the President of the United States, in a statement to the press on the four hundred and forty-ninth anniversary of the discovery of America, said, among other things:

Columbus acted according to the ideal of science. On the basis of assembled data, he arrived at a hypothesis; and he bent every effort to test his theory by actual experiment. The sighting of dim outlines of land in the distance, on the morning of the epochal twelfth of October, proved beyond contradiction his doctrine that dry land lay beyond the ocean; and he thereby opened new avenues of human history.

Neither Columbus nor any other man of science nor any statesman or colonizer could foresee the progress destined to be made by the lands discovered in the west. Nor can we of the present day foresee what further advances will be achieved in the coming years toward the goal of a world permanently at peace, permanently prosperous, permanently free. But we do know that the common striving of all of the countries of the Americas can be a powerful force in the interests of stability, peace, and freedom.

I quote these words of this eminent American statesman with the prediction that the last half century of the first half millenium of the discovery of America will see the culmination of this work in the scientific development which marks the bases of true civilization.

And that this may be so, two great conditions must be met: first, the triumph of liberty in the present world struggle; and second, the vision of a future based on science, but a future in which science is not exploited and falsified for the satisfaction of unhealthy ambitions, but, rather serves as a foundation for the political orientation of the world. And this vision must embrace not only the immediate future, but that which is yet far distant.

If we begin today to speed the fulfillment of the second condition, it will

greatly facilitate the attainment of our present aims.

As the result of new biological discoveries and the work of the organizations entrusted with their application in the conservation of health and the improvement of man, public health has become of extended importance and plays a greater rôle in the solution of the different problems of the individual, the family, the community, and the nation.

The American countries have been faced, and will be faced, with few problems which are equal in importance and urgency to that of defense.

It therefore seems logical that at a meeting of the American Public Health Association, which brings together health officers from all over the continent, we should discuss the manner in which all men dedicated to the national defense of each of their countries and to the joint defense of the Americas may coöperate.

It seems to me that the most important things for us to consider are: (a) the extension of public health work as part of the total defense in time of war, a function for which the term "biological" defense seems appropriate, as covering the different aspects included in our coöperation for defense; and (b) the means which must be employed to make this coöperation practical—the most important question.

In discussing the rôle of public health in defense, I shall omit the work of the medical and sanitary units attached to the armed forces, whose duties are to learn the biological efficiency of their personnel and to conserve and, where possible, to improve it.

The coöperation with which we are concerned forms the second line of this biological defense, and is closely tied up with the units which I have just mentioned, through its two great goals: the health of the individual and the healthfulness of the environment. We

have to be much more careful to prevent the development among the civil population of natural or artificially provoked illnesses which might spread to the army and naval forces, and we have to see that the limitations imposed by wartime economy have no repercussions in the causing of other illnesses or in the production of states of low vitality which will injure the "stock" of human power on which the nation must depend for military defense. In addition to this, we assure the training of physicians, so that they will not be lacking in our so-called "first line of defense"—that is so that they may be able to care for all the special needs of the armed forces.

What I have just said is, of course, known to everyone. The second question is how to proceed in order to attain our goals.

First we must remember that the battle is a battle of the whole hemisphere. We must, therefore, mobilize the Pan American Sanitary Bureau so that, while the danger exists, it may maintain an even closer coördinating connection with all the national departments of health and bring to them the best standardization of technics and disciplined coöperation.

We keep in mind that the military and naval forces have bases and will use in their operations certain roads which may be known before hand. Let us maintain the best possible sanitary conditions in the environs of bases and roads most likely to be used by the military forces.

We must also keep in mind the fact that these bases will be for the most part located in tropical zones, although some may be set up in temperate or even frigid regions. Therefore, our physicians and health officers, who may also find themselves at times working under the direction of the army or the navy, must receive special preparation for work in such regions.

We must realize that, just as the former war brought into use the so-called "chemical warfare," so, also, when the countries, now victorious, begin to face defeat the "biological war" of which so much has been said and written may be resorted to. If the armies or rather the commanders in the last war had foreseen chemical warfare, the latter would not have brought so much havoc. Let us be prepared, therefore, for a possible biological war.

The present war is characterized not only by the totality of the methods employed but by the necessity for the most precise coördination to maintain the unity of the whole. The whole civil, medical, and public health organization must stay in close coöperation

with the corresponding military and naval agencies. This is true both in the local national organizations as in the Pan American organizations when such are established.

This pleasant meeting in Atlantic City, where the representatives of all the departments of health of America are gathered with the American Public Health Association and the officers of the Pan American Sanitary Bureau permits me to suggest that the Pan American Sanitary Bureau and the United States Public Health Service study these problems, with the coöperation of the fellows and members of the American Public Health Association and of the sanitarians of the Americas whom they deem necessary and appropriate to this collaboration.

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"MEN who are occupied in the restoration of health to other men, by joint exertion of skill and humanity are, above all, the great of the earth.

They even partake of the Divinity, since to preserve and renew is almost as noble as to create."

*Voltaire*

# The Teacher of Hygiene and Public Health\*

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THOSE interested in the success of the health instruction program of the public schools are beginning to demand that hygiene shall be taught by able and well prepared teachers.

This quest for the qualified teacher is an eternal and most perplexing problem. It has practical consideration of the greatest importance for every generation of every century.

What criteria are teachers to use in judging their own capacities as health instructors? What standards are they to use in determining whether or not they have been truly effective in imparting health knowledge, shaping health attitudes, and influencing health habits? What guide is the school administrator to follow in selecting or assigning faculty members for the teaching of hygiene? What factors are health supervisors to have in mind when working for the improvement of instructional efforts on the part of teachers under their direction? These are all significant questions and we must come to grip with them sooner or later.

It is reasonable to say that health educators should have sound training in the fundamental sciences. It is intelligent to demand that they shall have an understanding of psychology and the philosophy and principles of educa-

tion. It is logical to conclude that health educators should have specialized training and experience in the field of health. It is also imperative to ask: does this preparation make a good teacher? Is it possible that a person can be qualified in these fundamental fields and still be an ineffective instructor? Does successful teaching result from careful preparation or is it a reflection of inborn capacities that must find expression? Does able teaching depend upon a few all-important characteristics or does it result from the interplay of a multitude of tangible and intangible qualities?

## SOME NEGATIVE RELATIONSHIPS

It is sometimes just as important to divest the mind of misconception as it is to recognize the truth. A study of the research dealing with the prediction of teaching success mostly tells us what is *not* related to effective instruction.

1. *Intelligence does not have a significant relationship to success in teaching.* Most of the studies show a correlation between these two factors of less than .425 and some indicate a relationship of less than .1. In one important study there was a negative correlation of —.035 for high scores and of —.004 for median scores on intelligence tests.<sup>1</sup>

The answer to this astonishing fact is not that intelligence is unrelated to successful teaching, but that teachers as a group are intelligent; hence this factor ceases to have value in discriminating

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between the good and the poor teachers. To put it another way, the minimal amount of intelligence needed for successful teaching is an essential requisite for getting through the teacher training institutions.

2. *Practice-teaching success and later field effectiveness have little in common.* An analysis of 15 investigations covering this point shows a correlation between these two factors of less than .36 in 14 of the studies.

It is difficult to explain this lack of significant relationship between practice-teaching success and later effectiveness in field teaching. On the surface it would appear that student performance in a classroom would be a most valuable criterion by which to judge future teaching success. Perhaps soft-hearted supervising teachers approve students who should not be allowed to qualify for teaching. Probably time and experience ripen the capacities of many who barely qualify in practice-teaching. It is likely, too, that some students with outstanding teaching ability are drawn into administrative or other positions that remove them from the classroom. Whatever the factors are that are in operation, they tend to destroy the value of the practice-teaching experience so far as prediction of ultimate teaching success is concerned.

3. *Scholarship in high school or college is not a good criterion for predicting teaching success.* Sandiford and others analyzed a number of studies of the factors involved in predicting teaching success and found that scholarship is not a dependable criterion.<sup>2</sup> With the exception of the findings of a single investigator the correlations between success in field teaching and high school grades ranged from .08 to .35. The correlation for single exception. None of the high enough significant

4. *There is a lack of correlation between teaching success and specialization in subject matter.* Odenweller found a correlation of only .281 between these two factors.<sup>1</sup> This study merely substantiates earlier findings. Dr. R. B. Montgomery of the University of Illinois has just completed a study of college hygiene courses and his conclusions are in keeping with earlier studies on this point.<sup>3</sup> Dr. Montgomery says:

The physician and nurse are without doubt the best prepared in the subject matter but . . . the physician knows the least about educational procedures and, as a result, is often a poor teacher. Several colleges report that they were forced to replace the physician instructors with others. I believe there are three reasons for this: (1) the medical curriculum offers no place for courses in education and most physicians feel that they cannot afford the time to take them later; (2) most physicians mistakenly assume that their knowledge of the subject is sufficient to make them teachers; (3) almost all physicians do not think of their students as very callow youth just out of high school and find that it is difficult to adjust their own methods of thinking to the adolescent level . . . there are very, very few physician teachers.

SOME PROMISING LEADS  
Research findings are not entirely negative. Odenweller made a study of 560 teachers in Cleveland on the assumption that if efficiency on the job is recognizable and measurable it is predictable.<sup>1</sup> The teachers in this study were ranked for effectiveness and personality by principals, assistants, and supervisors. Fellow teachers also ranked each other according to personality. A reasonably high correlation of .825 was found between personality and teaching effectiveness when both rankings were made by school administrators. When teachers in the same school building with the instructor being graded, there was a correlation of only .533 between teaching effectiveness as judged by administrators and personality as judged by these teachers.

While this study is not conclusive it reveals the fact that personality apparently has a closer relationship to teaching success than any other single factor that has yet been measured. We cannot attach too much importance to this conclusion because personality itself is a most intangible substance, assuming all forms with all individuals, and being very difficult to measure. Our common sense observations tell us, nevertheless, that some people do have a knack for getting along with others, for attracting others, and for leading others. We are apt to call this capacity personality and let it go at that, since we have learned from experience that personality is not confined to one channel or tabbed with a single label.

Several studies have been made in an attempt to evaluate teacher success from the standpoint of the pupil. Bryan analyzed the ratings of secondary school teachers by about 1,500 junior and senior high school students of New York City, and Cincinnati, Ohio.<sup>4</sup> From this study it would appear that students consider a teacher a good teacher when he (1) explains his subject matter thoroughly; (2) knows his subject matter thoroughly; (3) works hard at his teaching; and (4) is sympathetic to his students.

Hart made a much larger study of student ratings of teachers when he analyzed the opinions of 10,000 high school seniors in 66 high schools in widely distributed parts of the country.<sup>5</sup>

In rank order, the 6 combinations of characteristics considered most typical of the best liked teachers were as follows:

1. Is helpful with school work, explains lessons and assignments clearly; uses examples in teaching.
2. Cheerful, happy, good-natured, sense of humor.
3. Human, friendly, companionable, one of us.
4. Interested in and understands pupils.

5. Makes work interesting, creates desire to work, makes class work a pleasure.

6. Strict, has control of class, commands respect.

On closer analysis these 6 points can be boiled down to 4, namely, (1) teaching skill, (2) personality, (3) interest in pupils, and (4) leadership ability.

It is difficult to state which of these factors is the most significant, but pupils always place a high premium on sympathy, patience, and understanding. It is the teacher who is most concerned about the welfare of his students who takes the pains to explain most clearly, and whose personality is allowed expression through service to these pupils. Such people have leadership ability because young people can recognize and follow those who are genuinely interested in their welfare.

John Frederick Boyes, the English essayist of the past century recognized the value of patience and sympathy in the educational process when he once stated:

*If in instructing a child, you are vexed with it for want of adroitness, try if you have never tried before, to write with your left hand, and then remember that a child is all left hand.*

#### IMPROVING HEALTH INSTRUCTION

The recognition of the personal qualities involved in good teaching is not the solution to the problem of securing better health instruction. It is only part of the solution.

There are two broad methods by which we can improve the quality of teaching in the field of hygiene. The first involves the selection and training of new teachers. The second calls for the improvement of teachers already in the field.

1. *The training of new teachers*—A most serious indictment can be made against most of our teacher training institutions in respect to the preparation of their students in the field of health. At a recent symposium Dr.

Delbert Oberteuffer of Ohio State made this statement<sup>6</sup>:

... the majority of American professional departments of education are either ignoring this responsibility, or are making well-meaning but futile and inadequate efforts to prepare their students in the appropriate aspects of health education.

The difficulty, however, originates largely in the faculties of the colleges of education. Two years ago, in a study made of professional preparation in physical education, a dean of education in a midwestern university was asked about the school health program in his state. He replied that it was poorly developed, mainly because the school administrators were slow to adopt it. Later he admitted that his school prepared most of those administrators and that rarely did one of these men, who were to become principals or superintendents, ever elect a single course in health education.

None of the courses in health education were required, nor had the thought of requiring such training ever penetrated the thoughts of this dean or his faculty. Also gained in the same study was the impression that of the college presidents, zoölogists, psychologists, sociologists, physiologists, and professors of education interviewed, the group who knew less about the health problem in school life and who cared least about corrective measures were the professors of education.

Even with proper selection and training of teachers in the field of hygiene we can expect at best but a slow infiltration of these new teachers who are qualified for superior instruction. First, because the number of new teachers each year constitutes no more than 10 per cent of the total teaching profession and, second, because the great majority of these new teachers are trained as specialists in other fields than hygiene; so that the number of beginning teachers who are well qualified in the subject matter of health education must be pitifully small. Third, even those teachers with specialized training and all of the personal qualifications for successful teaching, will not be assigned to the task of health instruction. Under our present educational organization we train our teachers as specialists, but

it is very likely that only a few will find themselves delegated to the teaching of the problems on which they are best qualified.

2. *The in-service training of health instructors*—There is great promise of improvement when our efforts are directed toward increasing the capacities and skills of teachers who have already been assigned responsibilities in health instruction—first, because the teachers in service greatly outnumber the new arrivals; second, because there will be much less wasted effort in terms of training people for one job and seeing them assigned to other work; and third, because such teachers are most receptive to any form of help that can be given them in solving problems in the field of their immediate responsibility.

A few teacher training institutions have begun to work actively with teachers already in the field. The tide, however, has not yet rolled in that direction. May I suggest that field service courses in which the instructor travels from school to school and from community to community will be commonplace tomorrow?

Such training is a natural follow-up of the earlier preparation that the teacher may have received from a given institution. When the professor of education goes into the classroom to give specific help to the teacher who is grappling with practical pupil difficulties, you can be certain that the quality of both the preliminary training by the schools of education and the classroom effort by the teacher will improve greatly. The next great step forward in the social science of education will come when our educational institutions offer this service.

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## The Search for Unity

"IF we are to have a durable peace after the war, if out of the wreckage of the present a new kind of coöperative life is to be built on a global scale, the part that science and advancing knowledge will play must not be overlooked. For although wars and economic rivalries may for longer or shorter periods isolate nations and split them up into separate units, the process is never complete because the intellectual life of the world, as far as science and learning are concerned, is definitely internationalized, and whether we wish it or not an indelible pattern of unity has been woven into the society of mankind.

"There is not an area of activity in which this cannot be illustrated. An American soldier wounded on a battlefield in the Far East owes his life to the Japanese scientist, Kitasato, who isolated the bacillus of tetanus. A Russian soldier saved by a blood transfusion is indebted to Landsteiner, an Austrian. A German soldier is shielded from typhoid fever with the help of a Russian, Metchnikoff. A Dutch marine in the East Indies is protected from malaria because of the experiments of an Italian, Grassi; while a British aviator in North Africa escapes death from surgical infection because a Frenchman, Pasteur, and a German, Koch, elaborated a new technique.

"In peace as in war we are all of us the beneficiaries of contributions to knowledge made by every nation in the world. Our children are guarded from diphtheria by what a Japanese and a

German did; they are protected from smallpox by an Englishman's work; they are saved from rabies because of a Frenchman; they are cured of pellagra through the researches of an Austrian. From birth to death they are surrounded by an invisible host—the spirits of men who never thought in terms of flags or boundary lines and who never served a lesser loyalty than the welfare of mankind. The best that every individual or group has produced anywhere in the world has always been available to serve the race of men, regardless of nation or color.

"What is true of the medical sciences is true of the other sciences. Whether it is mathematics or chemistry, whether it is bridges or automobiles or a new device for making cotton cloth or a cyclotron for studying atomic structure, ideas cannot be hedged in behind geographical barriers. Thought cannot be nationalized. The fundamental unity of civilization is the unity of its intellectual life.

"There is a real sense, therefore, in which the things that divide us are trivial as compared with the things that unite us. The foundations of a coöperative world have already been laid. It is not as if we were starting from the beginning. For at least three hundred years the process has been at work, until today the cornerstones of society are the common interests that relate to the welfare of all men everywhere."—from *The Rockefeller Foundation—A Review for 1941*—by Raymond B. Fosdick, President

# Sensitivity to Coccidioidin Among Boys in an Eastern Preparatory School

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TUBERCULOSIS surveys of school children frequently reveal a small but significant percentage of persons who fail to react to tuberculin of proven potency, but who show on roentgenological examination calcified nodules characteristic of healed pulmonary tuberculosis. When these findings occur it is usual for the physician to assume that the x-ray findings are indicative of tuberculosis and that the negative skin test indicates that the individual has lost his sensitivity to tuberculin or is anergic. However, recent studies<sup>1, 2, 3</sup> suggest that in some instances the occurrence of a negative tuberculin test and roentgenologically demonstrable calcified pulmonary nodules could be explained by assuming that the x-ray findings represent infection with *Coccidioides immitis* rather than by the tubercle bacillus. Carter<sup>4</sup> and Thorner<sup>3</sup> have pointed out the similarity of the roentgen picture of coccidioidomycosis and primary pulmonary tuberculosis, and Cronkite and Lack<sup>1</sup> have described lesions similar to those of miliary tuberculosis in guinea pigs in which coccidioidomycosis was produced experimentally. A recent survey by Aronson, Saylor, and Parr<sup>5</sup> among some Indians in Arizona has revealed that, in those areas where from 90 to

98 per cent reacted to the intracutaneous injection of coccidioidin, about 15 per cent of tuberculin-negative children had calcified pulmonary nodules, while in areas where such reactions were infrequent or absent, only an occasional calcified nodule was observed in tuberculin-negative cases. These results suggest that the lung findings following infection by *Coccidioides immitis* and those of healed tuberculosis cannot readily be distinguished roentgenologically from one another.

The studies of Gifford,<sup>6</sup> Dickson,<sup>2</sup> Aronson, Saylor, and Parr,<sup>5</sup> and Smith<sup>7</sup> indicate that coccidioidomycosis may be more widespread than is generally appreciated, and stimulated us to make a survey of the students at an eastern preparatory school. All students are examined roentgenologically at the time of their initial medical examination, and all students showing suspicious or definite lesions of tuberculosis are reexamined annually or at more frequent intervals. The 680 students were tested with 0.01 mg. old tuberculin of known potency and, simultaneously, with 0.1 ml. of a 1:100 dilution of coccidioidin; those individuals negative to 0.01 mg. were subsequently tested with 1.0 mg. old tuberculin. The coccidioidin used in this study was prepared by Dr. Charles E. Smith of Stanford University by growing *Coccidioides immitis* on synthetic culture medium.

This study was aided by a grant from the Carnegie Corporation.

TABLE 1

Initials	Age in Years	Degree of Reaction * to 1:100 Dilution Coccidioidin Jan., 1941	Degree of Reaction * to 1:100 Dilution Coccidioidin April, 1941	Degree of Reaction * to 1.0 mg. Old Tuberculin Jan., 1941	Chest X-ray
G.B.	16	1+	±	Neg.	Neg.
A.B.	16	2+	2+	Neg.	Pos.†
W.D.	15	2+	2+	Neg.	Pos.†
O.G.	15	2+	1+	±	Neg.
D.H.	15	1+	1+	Neg.	Pos.†
F.K.	17	2+	1+	Neg.	Neg.
J.K.	13	2+	±	Neg.	Neg.
N.L.	17	1+	3+	Neg.	Neg.
B.L.	19	1+	1+	2+	Neg.
C.M.	16	1+	3+	2+	Pos.†
J.M.	18	±	±	±	Pos.†
H.R.	16	2+	1+	Neg.	Neg.
L.S.	17	2+	2+	Neg.	Pos.†
J.S.	16	2+	2+	Neg.	Neg.
E.T.	15	±	±	Neg.	Pos.†
J.W.	15	2+	3+	Neg.	Neg.
E.W.	17	±	±	1+	Pos.†

\* Edema 5 to 10 mm. in diameter=1+

Edema 11 to 20 mm. in diameter=2+

Edema exceeding 20 mm. in diameter=3+

Edema measuring 5 mm. or less in diameter=±

† i.e., calcified pulmonary nodules present

These students ranged in age from 13 to 19 years, 70 per cent being in the age group 16 to 17 years. Approximately 80 per cent resided in Massachusetts, New York, Connecticut, Pennsylvania, New Jersey, and Ohio, while the remaining 20 per cent represented 26 other states and 13 foreign countries. There were 10 students from Texas, 9 from California, 1 from Arizona, and 1 from New Mexico.

Of the students tested, 26 per cent were positive to 0.01 mg. of old tuberculin, and an additional 2.7 per cent were positive to 1.0 mg., while 17 individuals, or 2.5 per cent, reacted to 0.1 ml. of 1:100 dilution of coccidioidin. These figures are in sharp contrast to those of Thorner<sup>3</sup> who tested 200 children in the Bakersfield, Calif., area and found that 30 per cent of the children in the 0-4 year age group and 40 per cent in the 15-19 age group reacted to coccidioidin, and to those of Aronson, Saylor, and Parr,<sup>5</sup> who found that 89 per cent of 2,355 Indian children living in the southern part of Arizona reacted positively to 0.1 ml. of a 1:100 dilution of coccidioidin. The coccidioidin test

was repeated 3 months later with the same preparation of coccidioidin on the 17 students who reacted to the initial test. Similar reactions were obtained in 13 individuals, while in the remaining 4 cases the reaction was less marked than that observed on the initial test. Details of these tests, together with the data on each individual's age, tuberculin test, and chest x-rays are presented in Table 1.

After the coccidioidin test had been repeated, a questionnaire was sent to the parents of the 17 boys who reacted, and answers to the following questions were requested: (1) Has this boy always lived in the state in which he now resides? If not, in what other states has he resided? (2) Has he spent a week or more in any of the southwestern states? If so, in which states and approximately how long in each? (3) If he spent any time in any of these southwestern states, did he have any undiagnosed illness or any illness which was diagnosed as influenza while he was there? (4) Has he at any time in his life had an illness characterized by malaise, cough, fever, rash, joint pains and nodules over the extremities? Data from these questionnaires are presented in Table 2.

TABLE 2

Name	Residence	Ever in Southwestern United States	Any Illness in Southwestern United States	Never Any Illness Resembling Coccidioidomycosis
G.B.	New Jersey	No	—	No
A.B.	Ohio	No	—	No
W.D.	Kentucky	No	—	No
O.G.	Texas	Texas	No	No
D.H.	New York	No	—	No
F.K.	New York	No	—	No
J.K.	Maine	California— Several months Texas—1 week Nevada—1 week	Yes	"Glandular Fever"— California
N.L.	Missouri	Arizona	No	No
B.L.	Pennsylvania	No	—	No
C.M.	Ohio	Arizona (9 mos.)	No	No
J.M.	Maryland	No	—	No
H.R.	Connecticut	Arizona (2 wks.) California (2 wks.)	No	"Grippe"—Montana
J.S.	Missouri	New Mexico (2 wks.) Arizona (6 wks.)	No	No
L.S.	Connecticut	Arizona (5 mos.)	No	No
E.T.	Massachusetts	No	—	No
J.W.	Illinois	Arizona (18 mos.)	No	No
E.W.	Missouri	Texas (Several short visits)	No	No

It will be observed from Table 2 that of the 17 cases who reacted to coccidioidin, 9 had lived in or visited one or more of the southwestern states. Only 8, or 1.2 per cent, of the remaining 659 boys who gave no history of residence in the southwestern states reacted to coccidioidin.

Of the 17 boys who reacted to coccidioidin, 12 failed to react to the intracutaneous injection of 0.01 and of 1.0 mg. of old tuberculin. Of this latter group 5 gave no definite medical history suggestive of coccidioidomycosis, although they showed definite calcified pulmonary nodules ranging in size from 2 to 8 mm. in diameter, located well out in the lung fields and in the hilar area; 4 of this group had at no time visited or lived in the Southwest. Of the 17 boys who reacted to coccidioidin, 2 gave a history of an illness suggestive of coccidioidomycosis and 8 had at no time been west of the Mississippi River.

The protean manifestations of infection with *Coccidioides immitis* and the variability in its severity have made it difficult to determine accurately whether

or not any of those who have reacted to the coccidioidin test have had clinical evidence of coccidioidomycosis. It is true that all of these individuals have at one time or another had an illness resembling influenza or grippe which in some instances may well have been due to *Coccidioides immitis*; obviously one can only speculate as to the diagnosis in these cases.

#### SUMMARY

1. Of 680 students at an eastern preparatory school for boys, 17, or 2.5 per cent, reacted to the intracutaneous injection of a 1:100 dilution of coccidioidin prepared on synthetic medium.

2. None of the 17 reactors had been previously diagnosed as having had coccidioidomycosis; however 9 of them had spent some time in one or more of the southwestern states, while 8 had never been west of the Mississippi River.

3. Of the 17 who reacted to coccidioidin, 12 failed to react to the intracutaneous injection of old tuberculin and 5 of these 12 showed calcified nodules on roentgenological examination.

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## Home and Farm Safety

A STATE-WIDE educational campaign for Home and Farm Safety was inaugurated in Albany, N. Y., on March 26 by the Division of Public Health Education of the New York State Department of Health. Represented at the Planning Conference were some sixty organizations, including four other state departments.

Unanimously the group voted to develop a state program under the original leadership of the State Department of Health and to arrange a state conference on May 28, in Syracuse. Burt R. Rickards, director of the Division of Public Health Education, was chosen permanent chairman and authorized to set up an advisory committee.

Stanley H. Kershaw, director of the Home and Farm Division of the National Safety Council, Inc., Chicago,

under whom the New York State program will be administered as part of a nation-wide campaign to reduce the 37,500 annual deaths from home and farm accidents, set a five point goal for the state as follows:

1. To determine quickly what has already been done about home and farm safety in the state.
2. To perfect state-wide organization with all possible speed.
3. To plan state, county, and community conferences.
4. To disseminate to all participating groups practical information on methods of combating problems.
5. To develop a plan for intensive follow-up work.

In addition to a stimulating program of discussions during the one day state conference in Syracuse, it was planned to have a group of exhibits, among which is featured a "House of Safety."



# Isolation of Meningococcus from the Genitourinary Tract of Seven Patients\*

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THE isolation of the meningococcus from the genitourinary tract of patients with clinical evidence of gonococcal infection has not been reported in the literature. Epididymitis and seminal vesiculitis as complications of meningitis, however, are not infrequent.<sup>1,2</sup> Pick,<sup>3</sup> in 1907, isolated a meningococcus at autopsy from the abscessed seminal vesicles of a patient with cerebrospinal meningitis. The organism was differentiated from the gonococcus by carbohydrate fermentation and by serologic methods. Other authors have described the localization of the meningococcus in the genitourinary tract,<sup>4,5,6</sup> but the identity of the organism was not established by carbohydrate fermentation. Recently, Branham<sup>7</sup> identified as a Group II meningococcus a Gram-negative coccus that had been recovered from a case of urethritis diagnosed as gonococcal infection.

The present report describes the isolation of Group I meningococci from the genitourinary tract of 7 patients with symptoms of gonococcal infection.

## PROCEDURE

In the course of investigations on the survival time of the gonococcus in

urine<sup>8</sup> and on carriers in gonococcal infection, 103 strains of Gram-negative diplococci were isolated by standard cultural procedures.<sup>9</sup> Because of the volume of work entailed, further identification by carbohydrate fermentation could not be carried out immediately. In most instances, therefore, the fourth or fifth generation of each strain or organism was preserved in a frozen state at  $-70^{\circ}\text{C}$ . for approximately 1 month. The procedure followed was essentially that of Horsfall.<sup>10</sup> The growth from a 24 hour chocolate agar slant was suspended in from 2 to 3 ml. of sterile defibrinated rabbit blood which was then pipetted to a sterile cork-stoppered celluloid tube especially designed to withstand low temperatures. The tube was immersed in a mixture of dry ice and 95 per cent alcohol at a temperature of  $-80^{\circ}\text{C}$ ., after which it was stored in the freezing cabinet. In some instances, in addition to storage in the frozen state, duplicate cultures were maintained on chocolate agar.

Tests for carbohydrate fermentation were carried out on two different media. One was a tryptic digest agar to which were added 15 per cent ascitic fluid, Andrade's indicator, and a 1 per cent concentration of the desired carbohydrate, i.e., glucose, maltose, sucrose, or lactose. The other medium was Proteose

\* Studies carried out in coöperation with the Division of Venereal Diseases of the United States Public Health Service and with the Baltimore City Health Department.

Read before the Laboratory Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 14, 1941.

† On leave of absence from the School of Medicine and Dentistry of the University of Rochester as a Fellow of the Division of Medical Sciences of The Rockefeller Foundation.

No. 3 Agar,\* in which an autoclaved supernate prepared from an aqueous suspension of dried Bacto\* hemoglobin was employed as the enriching substance, and the respective carbohydrates added to yield a final concentration of 0.8 per cent. The indicator was phenol red. The fermentation reactions were carried out on several lots of each type of medium prepared at different intervals.

Seven strains, herein described, which failed to give the fermentation reactions of a gonococcus, were submitted to Dr.

growth on artificial media was more abundant than is typical of the gonococcus. Independent identification by Dr. Branham verified these findings, and further classified the strains as Group I meningococci.

The fermentation reactions of 5 strains were determined after preservation in the frozen state for 1 month. One strain (De) was tested shortly after isolation, and was not preserved by freezing.† The 7th strain (El) was maintained in duplicate, on chocolate agar as well as in the freezing cabinet.

TABLE 1

*Clinical Summary of Cases of Genitourinary Infection from Which Meningococcus Was Isolated*

Patient	Age (Yr.)	Sex	Race	Marital Status	Previous Gonococcal Infections No. Date	Clinical Diagnosis at Time Meningococcus Was Isolated	Date Meningococcus Recovered from Patient	Therapy Prior to Recovery of Meningococcus
Ha	22	F	C	M	1 1940	Chronic cervicitis	1/24/41	Diathermy
Sm A	23	M	C	S	1 1940	Anterior urethritis	2/20/41	Sulfanilamide—4 days
El	18	M	C	S	0	Anterior urethritis	2/17/41	None
Sm W	18	M	C	S	0	Anterior urethritis; epididymitis	2/4/41	None
Pa	22	M	W	S	0	Anterior urethritis	12/16/40	Sulfacetamide—8 days
No	29	M	W	S	2 1933–1936	Anterior urethritis	1/11/41	Sulfacetamide—4 days
De	25	M	W	M	1 1940	Anterior urethritis	3/29/41	Sulfapyridine—16 days Sulfacetamide—10 days Sulfathiazole—7 days

Sara E. Branham, of the National Institute of Health, for independent identification. In her laboratory they were identified by means of carbohydrate fermentations, by the type of growth on blood agar, by "halo" production on agar containing antimeningococcal serum,<sup>11, 12</sup> and by agglutination reactions with meningococcal typing serum.

#### RESULTS

Of 103 strains of Gram-negative diplococci that had been isolated from cases of gonorrhea, or from carriers of the infection, 7 proved to have the characteristics of the meningococcus, as evidenced by the fermentation of maltose as well as glucose. In addition,

The unfrozen agar culture fermented glucose only, while that preserved in the frozen state fermented both glucose and maltose, and was, therefore, identified as a meningococcus. A second culture recovered from patient El 70 days later was identified as the gonococcus.

A review of the clinical information on the 7 patients reveals no one factor which might explain the bacteriologic findings (Table 1). None of the patients was known to have had meningococcal infection, although this information was not ascertained for three of the group. Four had a history of previ-

† A culture from this patient, taken 1 month prior to the one reported herein, was identified as a gonococcus in the laboratory of Dr. Justina Hill, of the Brady Urological Institute.

\* Difco Laboratories, Inc., Detroit, Mich.

ous attacks of gonococcal infection. Four had received sulfonamide therapy for the current infection before the culture was isolated; the remaining 3 had not had any chemotherapy.

#### DISCUSSION

The differentiation of the meningococcus from the gonococcus is a more difficult problem than is generally recognized. Recent investigations have shown that the two species possess similar basic biochemical constituents and a close immunological interrelationship. The methods for differentiating the one from the other are carbohydrate fermentation and serologic tests, especially those based on "halo" formation. At present the meningococcus is known to differ from the gonococcus principally in that it is capable of fermenting the disaccharide maltose and that strains in Group I elaborate a specific carbohydrate.<sup>12</sup> As yet, a similar carbohydrate has not been demonstrated with certainty in the gonococcus.

The significance of the meningococcus in the genitourinary tract of patients with clinical symptoms of gonococcal infection is unknown. Only recently, Branham<sup>11</sup> pointed out that the gonococcus not infrequently invades the meninges and can be recovered from the spinal fluid. Although it has been known that these two species of *Neisseria* have many similar characteristics, both bacteriologic and serologic, our findings suggest still closer biologic relationship between the two organisms.

The source of the strains of meningococci recovered from the genitourinary tract raises some interesting questions. There are two possibilities, at least, to be considered. The meningococcus may have been introduced by contact with cases or carriers of the infection, or, the gonococcus may have acquired the biochemical activities of the meningococcus as a result of unusual environmental factors *in vivo*.

No single factor in the history of the 7 strains offers a possible explanation of the bacteriologic findings. At first, it might appear that freezing and storage at low temperatures had changed the biologic characteristics of a gonococcus, but the fact that one strain showed the characteristics of a meningococcus before as well as after freezing suggests that this is not a tenable explanation. Ostensibly, exposure *in vivo* to sulfonamide compounds cannot account for such a possible transition because 3 strains were recovered from untreated patients. On the other hand, until sufficient evidence has been accumulated to prove that sulfonamide compounds do not affect the characteristics of the gonococcus, this theory cannot be dismissed. The possibility of exposure of the organism to sulfonamide compounds in previous hosts must not be ignored.

The epidemiological significance of meningococci in the genitourinary tract may prove interesting. Similar findings have not been reported from laboratories in other sections of the country where large numbers of cultures from the genitourinary tract are examined for the gonococcus. The 7 strains described herein were isolated from residents of Baltimore. Of several hundred cultures of Gram-negative diplococci isolated from the genitourinary tract and identified by fermentation reactions in our own laboratories during the past decade, not one has proved to be the meningococcus, although both *Neisseria catarrhalis* and *Neisseria sicca* have not infrequently been recovered. It may be pointed out that the strains were recovered in the late winter and early spring, the season at which meningococcal meningitis is most prevalent.

Undoubtedly, as the cultural methods for the diagnosis of gonococcal infection become more universally employed in public health laboratories, additional data will be accumulated to interpret the significance of these observations.

## SUMMARY

Seven strains of *Neisseria* having the biologic characteristics of Group I meningococci have been isolated from the genitourinary tract of 7 patients with clinical symptoms of gonococcal infection.

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## Health Care in Defense

“THE first requisite of an effective working force; as of any army, is that it be well nourished, sufficiently well housed and clothed, and well cared for medically. The provision of essential health services to the whole population

cannot, therefore, be regarded as a luxury, as a ‘social gain’ to be shelved for the duration; rather, it is vital to the whole productive effort, as essential as oil to an engine.”

Louis S. Reed

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## PRIORITIES IN PUBLIC HEALTH

THE military services will undoubtedly draw severely on the supply of able-bodied workers now employed by health departments and it will be difficult to replace these losses with equally competent persons. Budgets, too, may be reduced. Nevertheless, the need for providing basic public health services will be greater than before the war. In these circumstances, health agencies may be faced with the task of deciding which of their activities are the more essential and which, with reasonable safety, may be curtailed or for the time being eliminated. A choice here will be difficult. The raiment of public health programs has never included patch pockets and cuffed trousers and so it will not be a question of discarding the superfluous, but rather of deciding between the more important and the less important.

Unfortunately there is no formula in public health administration by which a decision may be reached as to the relative importance of all the elements which go to make up a public health program. One may roughly gauge the seriousness of a problem by the recorded mortality and morbidity, but the worth of such an index is limited by a number of factors: how nearly morbidity and mortality figures represent the true situation, as in syphilis; the potentialities for disaster inherent in a disease at present only sporadic in occurrence, as in smallpox; the age at which illness ordinarily occurs in any given disease; the length of illness; the fatality rate. Then, too, aside from the relative importance of a public health problem, one must consider the effectiveness and applicability of known control measures in relation to that problem. Knowledge as to prevention and control may be very meager, as in poliomyelitis, or even with known preventive and control measures, application may be difficult because it necessitates more restraint or more curbing of liberty than many people are willing to observe, as in measures for the control of venereal diseases.

Assuming, however, that some authoritative body could provide a formula which in the abstract would give a key to the relative importance of public health activities, conclusions so reached would not necessarily be applicable in all situations. And even if allowance is made for the varying necessities which must exist

in so vast and complex an area as the United States, it must be remembered that whatever is done in public health in any given state or locality must finally be decided on the basis of the convictions and personal opinions of the administrative officer responsible. These opinions, to say the least, would vary. But in spite of the difficulties inherent in any attempt to determine the relative importance of the different activities which go to make up a public health program and of thus establishing program priorities, there is a brighter side to the picture. There would be little difficulty, for instance, in getting agreement as to the necessity of maintaining maximum effectiveness in excreta disposal, in the provision of safe water supply, and in insuring safe milk. Further, certain responsibilities are imposed upon all health departments in connection with the control of acute communicable diseases, and these activities must, therefore, be given priority claims. It is probably fair to state, too, that many places now conducting ambitious public health programs would find the community benefited if less important activities were eliminated and, with the funds and time thus saved, there were provided better case finding and clinic facilities in chronic communicable diseases, especially the venereal diseases.

One could easily list other public health activities which most administrators would regard as essential. We hold no brief though for giving prior claims to any particular schedule of services. On the other hand, it does seem wise that those responsible consider how best they can contribute to the public health through the lean years ahead when staffs and budgets may be reduced to skeleton-like frameworks. Much undoubtedly could be accomplished by having one health officer serve where previously there were two; with better community organization and more participation by carefully directed lay groups; by a willingness to face the fact that in some areas programs are carried on intensively and extensively in this service or that because of tradition, personalities, and entrenched bureau strength, rather than because of the seriousness of the problem or the productiveness of the program. In any event, those interested in this subject, and most administrators will be interested, may find some aid in recent developments of the work of the Committee on Administrative Practice. A subcommittee of this group, responsible for the fact-finding schedules of the Health Conservation Contests, has indicated an admirable tendency to go through from the superstructure of health activities down toward their foundation. If no foundation is discovered, this Grading Committee takes the very logical attitude that the structure as a whole is unsound. Thus, if the public water supply is neither approved for safety nor available to most of the population, the entire sanitation program must be regarded as inadequate no matter how much laborious routine is attempted. Doubtless some might disagree with the conclusions in detail, but the method which this Grading Committee has adopted has much to commend it, and we suggest that those who are facing problems of priority in public health obtain the committee's aid in an effort to reach a wise decision on this matter.

## PLANS FOR INSTRUCTION IN TROPICAL MEDICINE

**I**F against an atlas of the world one matches place names in the news of military and naval operations of the United States of America, a very high proportion of these names will be found to lie between the Tropics of Cancer and Capricorn, or not far north of the former or south of the latter. This means inevitably that

our expeditionary forces will be exposed to diseases endemic and epidemic in the hot countries and that officers of the medical and sanitary corps will be faced with the problems of prevention and control of such diseases. Because this is so, there has been a marked up-swing of interest in the general subject of tropical medicine, and many medical schools and schools of public health are quite wisely emphasizing instruction in these subjects.

The problem of maintaining health and controlling disease in the tropics is found not only in the physical environment, but also in the broader field of ecology. High temperatures and humidity, and intense solar radiation seriously handicap the newcomer; and these same conditions contribute generally to abundant propagation and survival of certain bacteria, protozoa, viruses, mycotic forms and insects which find man a desirable or necessary host. Against some of the diseases which exist, reasonably effective preventive measures have been developed. But the application of procedures for control will necessarily be limited where there must be rapid troop movements, the inauguration of temporary depots and lines of supply, and the emergency construction of roads. Troops entering these areas will go in without the naturally acquired immunity which most of the surviving natives will possess against many of the diseases. For these reasons, as well as for others, medical officers must not only be oriented as to formal and conventional methods in tropical medicine, but must in addition be so thoroughly familiar with their subject that they will be able to meet promptly the necessities of varying situations, to extemporize, and otherwise provide to the troops the maximum protection available in difficult circumstances.

It needs further to be emphasized that the prevention and control of tropical diseases is not a one man job. There is first, of course, the problem of diagnosis and treatment of those already affected by diseases with which physicians in this country are not now familiar. Second, there is the question of prophylaxis of the individual through vaccines, drugs, strict care as to food and drink, personal hygiene. Then come the larger measures of disposal of excreta, not only for troops but for adjacent populations, the location of camps, the choice and disinfection of water supplies, and measures which relate to the control of insects or protection from them. This, of course, is a generic rather than a detailed list of the problems which must be met, but it is sufficient to indicate that not only will the knowledge and skill of physicians be necessary but also the services of sanitary engineers, entomologists, parasitologists, bacteriologists, and others, including common laborers. Likewise, the teaching of these subjects will demand more than clinicians and microscopists.

In view of the situation to be met, all must commend and further the plan of instructing medical and public health personnel in the problems and control of diseases in the tropics. There is, however, one aspect it would seem wise to consider seriously. It is this: there seems some danger that, as occasionally happens in the teaching of other subjects, emphasis may be given to the exotic and dramatic diseases of the tropics rather than to those which, though constituting far greater hazards, have lost their appeal because of previous though desultory interest in them. For instance, one is likely to be intrigued with the picture of an elephantoid scrotum so large that the individual must trundle it before him in a wheelbarrow. This sort of thing, of course, is to the surgeon as is a red flag to a bull. He wants to do something about it and can. Actually, though, while some of our troops will undoubtedly get filarial infections, the results will be not nearly

so disastrous as they are likely to be from the lowly and familiar dysenteries. Again, the very names of some of the tropical diseases carry within themselves threat and mystery: Schistosomiasis, Trypanosomiasis, Calabar swelling, Dumdum fever, Verruga Peruviana, Pappataci fever, etc. But all these added together will probably be of no moment when compared with what must be faced in connection with malaria. Yellow fever may, of course, be of serious concern, and is a subject upon which officers of the medical and sanitary corps should be well informed. Fortunately our troops will go into tropical areas vaccinated against this disease. Also, troops in certain parts of the Orient may face a menace in local cholera situations, and it is possible that typhus and plague, though not confined to the tropics, may be endemic in areas of military operations. Dengue, too, may render high proportions of troops simultaneously and temporarily non-effective. But most of these diseases are limited geographically, are absent in many parts of the tropics, or are not necessarily highly endemic. Malaria and the dysenteries, on the other hand, are practically everywhere in the warm countries, and although in considering them one may not through an association of ideas experience the thrill and glamour of blue seas and waving palms, the medical officer, in studying tropical epidemiology and ecology, would do well to major in these two diseases which are almost unlimited in their capacity to produce illness and death.

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## What and Who Is an Epidemiologist?

*Comments on an editorial published in the April, 1942, issue of the Journal:*

C. F. Adams, M.D., Director of Laboratories of the State Board of Health of Missouri, Jefferson City, writes: "I should say that an epidemiologist is a physician (M.D.) who investigates the presence (diagnosis), extent, source (water, food, air, etc.), and control of an epidemic or outbreak of any disease. He would use, either in person or through others, many subsidiary sciences, such as bacteriology, protozoology, helminthology, medical entomology, mycology, chemistry, sanitary engineering, and at times statistical methods. These subsidiary sciences generally would be represented by others in a consultative relationship.

"In other words, an epidemiologist is a medical inspector who goes into a community to find the *what* and *why* and *control* of an outbreak of any disease.

"The epidemiologist would, no doubt, become interested in past epidemics, and would marshal a vast material relative to duration and source, and in this regard his statistical methods would be one of his most powerful instruments.

"As a paleontologist is a zoölogist studying prehistoric fauna, so the epidemiologist would be, in this case, a physician investigating past outbreaks of disease."



# Credit Lines

A Selective Digest of Diversified Health Interests

D. B. ARMSTRONG, M.D., AND JOHN LENTZ, M.S.

## WHAT THE PUBLIC WANTS TO HEAR

"Foot health is vital to victory—Wear our scientifically fitted shoes"

"Get your health from the sea—Eat fish for victory"

These slogans (if they may be called such) typify the extremes to which some advertisers go to stress the relationship of their products to the two subjects that now seem to be uppermost in the public's consciousness—victory and health. Perhaps you have seen similar examples and have also been struck by their absurdity. Although it may be difficult to control this cheap sort of health exploitation, we feel it our duty to "go on record" as having raised our voices in protest. Now, of all times, it is not only inappropriate but downright unpatriotic to couple health with questionable ballyhoo.

Perhaps, after all, the public is not much impressed by such advertising copy. Certainly few are gullible enough to believe that the war effort and the nation's health are vitally dependent upon "scientifically fitted" shoes and daily portions of broiled mackerel. Yet claims of this sort may actually prevent the full realization of the potential war effort as they contribute nothing to the psychological drive so necessary to a country at war.

And this brings us around to the question of what the public *does* want to be told today—a question that should concern health educators. W. J. Weir,

in a recent issue of *Printers' Ink*, made a forceful statement along these lines. Most of us will agree with Mr. Weir that the public wants to be told many of the following things:

We want to be told—not to remember Pearl Harbor. We want to be told to take Tokyo, to bomb Berlin, to raze Rome.

We want to be told—not to help keep our world and our way of life from being lost. We want to be told to help build a *new* world and a *better* way of life.

We want to be told—not to buy Defense Stamps or Defense Bonds. We want to be told to buy *Victory* Stamps or *War* Bonds.

We want to be told—not to do our part to keep Nazism or Fascism from these shores. We want to be told to do our part to spread Americanism to *all* shores.

We want to be told to sing battle songs. Don't tell us there'll be bluebirds over the white cliffs of Dover. To hell with bluebirds. Tell us there'll be vultures and a deathly silence over Berchtesgaden.

We want to be told that we are going to win lebensraum for our democratic way of life.

According to *Printers' Ink*, these are the things the public wants to hear! Many would like to see more publicity emphasizing most of these angles—and less ballyhooing of dubious approaches to health and victory.

## AN EDITORIALETTE:

### HEALTH EDUCATION IN PUBLIC HEALTH

While the factor of health education in public health is not *all* important, it is indeed vital to all other elements in public health and preventive medicine as practised in the modern community. Health education helps to create its associate units essential in a basic health program. It should permeate all of

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these related services and influences. On the other hand, without these concrete services, such as medical examinations in schools, clinic facilities in health centers, examination services in industry, health education tends to remain a highly intangible, theoretical, abstract and largely futile commodity. It finds its substantiation in its relationship to these practical services. It is visualized, precipitated, brought out of the realm of theory by its contact with its basic service colleagues. It, therefore, has a creatively reciprocal relationship with the other elements in public health. It enhances their value and reality, and finds its own realization through them. *Health education is the one element in our health program that contributes most to making the whole public health effort substantially greater than the sum of its parts!*

#### RECENT HEALTH PUBLICATIONS

At this time of the year, reports—annual and otherwise—blossom forth in clusters. One of the best of the current crop comes from the W. K. Kellogg Foundation of Battle Creek, Mich. Under the title, "The First Eleven Years," the varied activities undertaken by this great agency since its inception are discussed and pictured in a highly effective manner. The work of the Kellogg Foundation is well known to workers in public health, its innovations in many fields having placed it in the forefront among agencies of its kind. But one will gain a new and fuller appreciation of the Foundation upon reading this excellently prepared summary. It is reassuring in times like these to find so much emphasis on the part of the Foundation upon democratic principles and their relation to successful community enterprises. It is also reassuring to note that the Foundation does not plan to rest on its laurels but is already looking to the future, planning greater achievements. The Founda-

tion staff is to be congratulated on its report which is handsomely bound, well written, well organized, and illustrated with a wealth of good photographs.

The 1941 report of the Georgia Warm Springs Foundation sets forth the highlights of another fruitful year of work in the medical care and treatment of infantile paralysis victims. This compact report includes a foreword by Franklin D. Roosevelt, a series of striking photographs which "catch" the cheerful atmosphere of the institution, and pertinent information regarding the history, current activities, and financial affairs of the Foundation. From the standpoint of make-up, the 1941 report is noted for its clean simplicity of type and layout. Copies may be secured from the Foundation, Warm Springs, Ga.

"Something new has been added" to the health library of the John Hancock Mutual Life Insurance Company, the title of which is "Guarding Your Family's Health." This recent publication, authored by Wilson G. Smillie, M.D., is devoted to general health information. Readers will find here an interesting and illuminating discussion of modern public health facilities, and what they mean in terms of the individual's welfare. The publication gives due recognition to the work of nonofficial agencies and group medical prepayment associations. The format of the booklet is most attractive and the cover design and illustrations are done with distinction. *Guarding Your Family's Health* is available without cost from the Life Conservation Service of the John Hancock Life Insurance Company, Boston, Mass.

Farm and home safety is becoming a subject of increasing interest to health departments, as evidenced by recent meetings at which programs to combat this part of the safety problem were formulated. Thus health workers will

find a new publication of the International Harvester Company particularly timely and valuable. Under the title of "Stop Carelessness! Prevent Accidents!" a most comprehensive survey of every type of accident hazard on the farm and in the home is presented. This publication contains a valuable collection of photographs illustrating conditions that often lead to injury or death. There is excellent teaching material in this booklet. Several pages of first aid information are also included in the contents. Copies are available without cost from the International Harvester Company, 180 North Michigan Avenue, Chicago, Ill.

Two significant articles from recent issues of *Hygeia* have been issued in reprint form by the American Medical Association. "Our Selectees Are Healthier" is the title of one. It deserves wide distribution, as a great deal of misleading information has been circulated about the state of the national health. This authentic analysis of the draft rejections and health conditions in the armed forces will go a long way toward reassuring the public that the nation's general health was never better. The second *Hygeia* article, available in reprint form, is entitled "Health at the Crossroads." This article stresses the resources of the modern health department and their rôle in the community of today. Both reprints deserve wide use. Write to the A.M.A., 535 North Dearborn Street, Chicago, for quantity prices or send 10 cents for a single copy.

To health workers particularly interested in the development of school health programs, a bulletin outlining the school health policy of Ohio can be highly recommended. This publication outlines in a concise but complete manner the objectives and the fundamental principles underlying Ohio's school health education program. In reviewing

this bulletin, one is impressed with the well rounded nature of the program and the emphasis placed upon coöperative relationships. "No local school health program is able to function properly as an isolated endeavor, for it must be a coöperative effort of school, home, community, and state in the interest of the whole child and the future citizen," the bulletin states. The Advisory Committee on Health Education of the Ohio Public Health Association is to be commended for its work in defining and coördinating the state's school health education program. Copies of the bulletin may be secured from the Association, 1575 Neil Avenue, Columbus, Ohio. Single copies are priced at 20 cents.

A simple vest-pocket leaflet on syphilis and gonorrhea has been issued by the State Department of Health of New Jersey. This publication is unique in that it minces no words about prostitution, alcohol, and prophylactic procedures. Heretofore, venereal disease literature marked by such frankness has been distributed chiefly to men in our armed forces. The New Jersey health authorities, however, maintain that the war effort "now makes it very important that the civilian population be given instruction as to the prevention of these diseases." The New Jersey leaflet amply "fills the bill." Copies may be had by writing the State Department of Health at Trenton.

The Division of Maternal and Child Health of the Montana State Board of Health has prepared a series of nine prenatal letters which are sent directly to patients under the care of physicians. The content of these letters covers practically every topic about which the prospective mother is concerned. The text of each is direct and informative. We suspect that these letters not only serve an educational purpose, but also save "wear and tear" on the physician

who might otherwise be required more frequently to travel long distances in the wide open spaces to visit patients more in need of simple information than actual medical care. Copies of the letters are available from the Montana State Board of Health at Helena. They are well worth the attention of all workers in maternal health programs.

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Group voluntary (prepayment for medical costs) health associations are springing up in many sections of the country today and it appears that a new type of health education material may be expected from these associations. In fact, one of the leading agencies of this type in New York State—the Group Health Cooperative—has recently inaugurated a popular health bulletin for its subscribers. The content of the first two numbers emphasizes several timely health topics—including individual health in national defense, nutrition, keeping fit in the city, etc. There are also news items concerning affairs of the Cooperative and developments in the public health field of general interest. The bulletins are sound in content and well conceived editorially. Congratulations to Winslow Carlton, Executive Director of the Group Health Cooperative, 1790 Broadway, New York, N. Y.

#### INFORMATION ON MOVIES

Motion pictures are perhaps our most popular medium of health education. It is doubtful, however, if we have learned to use films as skillfully as we might. Studies throwing light on this important tool of instruction are consequently of considerable value.

A survey recently concluded by the Health Education Service of the National Tuberculosis Association, while it dealt only with films on the tuberculosis problem, nevertheless brings out many pertinent facts that all producers of health films would do well to study.

According to replies received in answer to a questionnaire, the "composite" tuberculosis secretary prefers (1) a motion picture in *drama* form, (2) appealing to the *general public*, (3) for the purpose of *teaching people* what to do for themselves, (4) emphasizing the *x-ray*, and (5) with a running time of *15 minutes*.

The N.T.A.'s survey also elicited criticism as to what's wrong with health movies. Poor craftsmanship topped the list of critical barbs. In reply to this, the N.T.A. states: "We make no excuse for poor craftsmanship, but remember we do not aspire to match the finest Hollywood products. We want sincerity, simplicity, and realness, even at the sacrifice of photogenic quality. Our films must be entertaining, but essentially they are designed to teach, persuade, to win support of tuberculosis control work." Criticisms were also voiced regarding the quality of sound recording. In reply to this it was pointed out that complaints on this score are often unjustified, as the operator, the projector, or the acoustic properties of the room are most frequently responsible for unsatisfactory sound.

For what purpose are tuberculosis films needed? The following varied answers were given to this question: (1) to teach people what to do for themselves, (2) to inform people about modern facilities, (3) to stimulate leaders to support tuberculosis control measures, (4) to relate tuberculosis to some social problem, such as housing and nutrition, (5) to build good will.

The survey disclosed that films should be developed that appeal to the general public. "Movies should have a universal appeal for people in all walks of life rather than for those of a special or chosen group."

As to types of treatment, the dramatic form of movie is preferred even though it is difficult to convey an educational message by means of dialogue.

Instructional, cartoon, documentary, and didactic narration films were among the other types of films suggested by those who answered the questionnaire.

In regard to length, the 15 minute film was deemed most serviceable, while some of the individuals polled preferred movies running to 20 minutes.

Surveys of this nature will go a long way toward helping health educators understand better the rôle of films in the educational field, their possibilities, and limitations.

Since the users of tuberculosis films voted for more pictures emphasizing the x-ray, it might be well for those charged with the production of future movies, and other educational materials, to guard against overemphasis. Due recognition should be given to the other participating factors in the tuberculosis control program, including the private medical practitioner.

#### AT LAST—EDUCATION PAYS

Welcome news comes from the American Medical Association concerning *Hygeia, The Health Magazine*. In the Association's annual report to its officers, the statement is made that "for the first time in several years *Hygeia* credits were greater than debits, in the sum of \$15,738.06." It may be safely said that such a favorable balance has probably not often prevailed in the history of a publication devoted to education and service rather than to profit making. Moreover, the A.M.A. has abundantly demonstrated the utility and practical feasibility of a major publication dealing popularly with health education and disease prevention. Many years ago when *Hygeia* was launched there were, among those in the medical and public health professions, probably more skeptics than optimists regarding its financial future. It must be especially gratifying to the staff of *Hygeia* to find the publication prospering at a time when so many established journals

are merely "getting by," because of diminishing advertising revenue.

While *Hygeia* now has 114,000 regular subscribers, it merits a larger audience. The magazine has constantly improved in editorial content, as evidenced by the number of articles which *The Reader's Digest* draws from its pages. Moreover, *Hygeia* is widely quoted in the press and over the radio. The magazine's art staff also deserves credit for the general excellence of the publication's illustrations and format.

We wish continued years of prosperity to this valuable magazine and hope that its health messages will reach an ever widening circle of readers.

#### PUBLICITY TIPS FOR THE DURATION

Representatives of several health organizations in New York City recently participated in a round-table discussion on "Health Education in Wartime." Some of the observations growing out of this meeting are of interest to health workers generally.

The participants considered ways and means of putting the health educator's message before the public despite the limitation of newspaper space growing out of the increased volume of war news. To insure acceptance of health news, it was recommended that only newsworthy material be presented to editors, that stories be submitted in the form of press releases so that rewriting is not required, and that all material be checked thoroughly to make sure that it contains no information of aid to the enemy.

The relationship of health to the war effort was another topic receiving attention. It was the feeling of the participants that material stressing the tie-up between health and the war must be presented gradually to newspapers and not overdone. Editors are receptive to news on tuberculosis, nutrition, syphilis, the prevention of blindness, nursing, and the like, because these subjects

have a clear-cut bearing upon the war effort. Because of the war, women's page editors are more interested in health news than ever before. In this connection, it is well to remember that health news may be used again and again if each time it is presented from a fresh and new angle. After health education information is presented to the public through newspapers, it should be followed up through the use of other media—such as the radio, the health lecture, or through nurses during home visits.

Concerning the use of radio, it was pointed out that pressure upon broadcasting stations for time is increasing because of the many war activities that must be aired. Thus the standards of health education broadcasts must be raised if they are to be presented via radio. One of the networks that has accepted health material for presentation has suggested that a way of improving the content of health broadcasts lies in the development of a definite radio character or personality to deliver weekly talks. In this way a stress of continuity may be established and a definite audience gained. This scheme has been successfully carried out by the New York State Department of Health through its radio character "Dr. Jones" and by the Baltimore City Health Department through its "Dr. Ashley."

Another plan to improve broadcasting is being developed by the New York Academy of Medicine, in coöperation with the major chains. Here an attempt is being made to bring together the professional man, who knows his subject but is not an expert in radio presentation, and the radio authority with extensive experience in the effective use of the air for entertainment or advertising purposes. Prior to the radio address, these two experts from different fields will try to shape the form and content of the health message so as to increase its utility through this medium. This

experiment will be studied with very great interest.

#### CONCERNING A POSTER

Booklets, posters, and other publicity materials issued for use in safety education are becoming increasingly effective. Excellent examples of publicity material are available today from a number of safety organizations, particularly the National Safety Council, 20 North Wacker Drive, Chicago, Ill. Outstanding among the Council's current publicity media is a series of war posters, the sixth of which is now ready for use. It is such a splendid example of poster art that it deserves special mention in these columns. Three statements—Keep 'em Fighting, Production Wins Wars, Stop Accidents—are grouped around a handsome painting of a sailor loading ammunition. The expert way in which the text and the illustration have been handled results in a poster that has great impact. Wherever this poster is displayed it will certainly stop passers-by in their tracks. Posters like this are an excellent contribution to the nation's war effort.

Health educators—take note of the work that our colleagues in the safety field are doing. There is much that we can learn from them.

#### FOR YOUR RADIO PROGRAM

The government needs 50,000 well qualified students to enter schools of nursing. It is an urgent need and every health agency in the country should aid in the publicity drive that is now in progress to enroll young women in the profession. Excellent publicity materials are available, including two 15 minute radio programs which have been recorded by the Nursing Council on National Defense. The recordings are entitled "Night Nurse" and "Public Health Nurse," and to date they have been broadcast by almost 500 radio stations. Has your local station pre-

sented them? If not, these dramatizations should be offered to the program director.

The scripts of both dramatizations are full of items of human interest and at the same time they impress upon the listener the fact that the nursing profession offers an unequalled opportunity for service to humanity in times of peace as well as in times of war. The dramatizations are so well presented that any program director should welcome them for a prominent "spot" on his evening schedule. Each script ends with an appeal to young women—Mrs. Franklin D. Roosevelt speaking on the "Night Nurse" recording and Surgeon General Parran on the "Public Health Nurse" program.

Inquiries concerning the double-faced recording of these scripts should be addressed to David Resnick, Public Information Consultant, Nursing Council on National Defense, 262 Madison Avenue, New York, N. Y.

Other interesting and timely radio material that can be used to great advantage now may be obtained from the National Society for the Prevention of Blindness, 1790 Broadway, New York, N. Y. The Society offers two transcriptions, free of charge, to any health organizations that may wish to use them. "Eyes for America's Future" is the title of one of the transcriptions. It stresses the fact that good eyes are not only essential for men in military service, but they are also necessary for skilled craftsmanship in the shop. The second transcription is called "Man Was Born to See." It deals with some of the more common causes of blindness and how loss of sight may be prevented.

#### MAGAZINE ARTICLES

Current popular magazine articles on health or of medical import:

"Keep Up with Medicine" (a new monthly feature). *Good Housekeeping*, May, 1942.

"Doctors in Uniform." Maxine Davis. *Cosmopolitan*, May, 1942.

"Why Teachers Are Neurotic." Frances V. Rummell. *Good Housekeeping*, May, 1942.

"The Army's Menu Maker." Maxine Davis. *Coronet Magazine*, May, 1942.

"A Working Cure for Athlete's Foot." Paul de Kruif. *The Reader's Digest*, May, 1942.

"Nerves in the War." George W. Gray. *Harper's Magazine*, May, 1942.

"Skyscraper of Healing." William McDermott. *Coronet Magazine*, May, 1942.

"What We Know about Vitamins." Waldemar Kaempffert. *New York Times Magazine*, May 3, 1942.

"Fun in a Dentist's Chair." William F. McDermott. *Coronet Magazine*, April, 1942.

"Death in a Drinking Fountain." Michael Evans. *Coronet Magazine*, April, 1942.

(The above is not presented as a complete list and the articles cited are not necessarily recommended.)

#### JOTTINGS

The appointment of Dr. Benjamin G. Horning as Chairman of the Ninth Institute on Health Education has occasioned much favorable comment. Dr. Horning's varied experience in public health gives reassurance that the forthcoming Institute program will be in capable hands. Dr. Ira V. Hiscock, who is largely responsible for the growth and success of previous Institutes, will be missed by one and all. . . . We understand that serious consideration is being given by the New York Academy of Medicine to having its library index and catalogue the more important and significant health education reports and publications—a service that should be of value in the future. . . . Suggested slogan for public health workers: "Help to save lives—Help to win the war." . . .

Another slogan from Elda Robb of Simmons College Home Economics Department: "People who are 'all in' cannot go 'all out' for defense." . . . Joke of the month: "I do hope you keep your cows in a pasture," said Mrs. Newlywed as she paid the milkman. "You see, the health department says pasteurized milk is much the best." . . . Are you familiar with the film program of the General Electric Company? Many of the pictures produced by this organization deal with scientific subjects—x-rays, the biology, of microscopic life, research, and the like. A catalogue listing all films available from this source may be obtained by writing the Visual Instruction Section, General Electric Company, Schenectady, N. Y. . . . Quotation from Ralph Waldo Emerson: "Education is not pouring knowledge into minds; it is not erudition. A person is not truly educated unless knowledge influences his *doing* as well as his *thinking*. In so far as learning alters and directs *behavior* it is education." . . . A city-wide immunization campaign against whooping cough was undertaken recently by the Boston Health Department. . . . An interesting and valuable series of lectures and discussions has been taking place monthly since January, 1942, with one lecture concluding the series in May, dealing with health education from the angles of nutrition, mental hygiene, sociology, advertising and public health. This series represents the first joint effort in

this direction by the New York City Welfare Council and the Academy of Medicine, the lectures being open to members of the staffs of the many agencies participating in the Welfare Council. The April meeting, presided over as usual by Dr. D. B. Armstrong, was enlivened by an excellent presentation by John Benson, President of the American Association of Advertising Agencies, on the contribution of commercial advertising to health education. . . . We hear interesting reports of an experiment that is now in progress to evaluate the teaching performance of public health nurses. A microphone, disguised as an inkwell, is placed on a desk in the room where nurses interview patients. The conversation between the nurse and the patient is picked up by the microphone and recorded. Later the record of the interview is studied to determine the effectiveness of the nurse as a teacher, the patient's reaction, and the like. . . . The technical Committee on Evaluation of Motion Pictures of the New York City Nutrition Program has reviewed 37 films on food and nutrition and rated them according to accuracy of subject matter, organization of material, quality of film presentation, and educational value. The committee's report will be published during the summer by the American Film Center. The preliminary report indicates that this will be a most valuable guide for organizations using films in nutrition programs.



## BOOKS AND REPORTS

**Communicable Disease Control—**  
(*A Volume for the Health Officer and Public Health Nurse*)—By Gaylord W. Anderson and Margaret G. Arnstein. New York: Macmillan, 1941. 434 pp. Price, \$4.25.

This book is divided into two parts, in the first of which the principles underlying communicable disease control are discussed. The difficult task of summarizing the historical background and generally accepted theories of epidemiology and disease control is for the most part handled satisfactorily and with avoidance of sweeping generalizations and discursive writing. In fact, the authors have apparently exercised so much care in selecting and qualifying words and phrases that at times their style is slightly laborious and certain passages are somewhat difficult to read. Chapters in the first part of the book deal with the organization of health services, the legal aspects of the subject, the rôle of the public health nurse, and nursing care in the home. Methods of investigation and analysis of data are covered in another chapter.

The second part of the book contains brief descriptions of individual diseases and the steps to be taken during their investigation and management. Each disease is treated more or less uniformly, with specific recommendations as to the functions and responsibilities of the health officer and the public health nurse in prevention and control. Presentations of material on clinical aspects, the epidemiology of individual diseases, and the administrative features of their control are nicely balanced as to space and content. But the book is much more than an ordinary reference manual or a dry compilation of facts regarding the diseases covered. It reflects the wide experience of the authors and contains

valuable hints and practical suggestions that are obviously the result of first hand observations and study in the field.

Statements and opinions expressed throughout the book are in general accurate and in conformity with the most recent discoveries and beliefs. Some authorities would take exception to using the term "infected" to describe contaminated water and milk supplies, since infection implies multiplication of the causative agent in the medium. The authors state that references at the end of each chapter have been selected on a basis of easy access and are not all-inclusive. In view of some of the references to recent contributions which have been included there are rather surprising omissions, such as the tuberculosis studies of Stewart and his associates, and the original paper on the transmission of yellow fever to monkeys by Stokes, Bauer, and Hudson.

As a useful summary of American practice, and because it brings together in a unique manner the functions of the health officer and the public health nurse, the book is to be recommended to all workers in communicable disease control.

GEORGE H. RAMSEY

**Modern Bread from the Viewpoint of Nutrition—**By Henry C. Sherman and Constance S. Pearson. New York: Macmillan, 1942. 118 pp. Price, \$1.75.

This short summary on bread will be most helpful to all health workers since many of the questions which they are continually asked are answered in this book. The authors point out that while staple white bread has been highly developed and standardized technologically, little attention has been given to its nutritive value. The breads of a century ago, those of a decade ago, and those now being introduced all have

energy values of about 1,200 calories per pound, but they differ greatly in protein value and in mineral and vitamin content. Special emphasis is given to the loss of mineral elements and B vitamins as a result of modern milling methods and the various procedures now being used for correcting these deficiencies. The requirements proposed by the Food and Drug Administration for enriched breads are given.

The authors are to be complimented on the last chapter in which emphasis is given to the fact that for some years to come the bread problem will present a tentative or transition aspect from more than one point of view.

C. A. ELVEHJEM

**Industrial Surgery**—By Willis W. Lasher, M.D. (rev. 1st ed.). New York: Hoeber, 1942. 472 pp. Price, \$6.50.

This is an enlarged first edition of the book originally published in 1938. It contains 472 pages, 194 illustrations, a bibliography of 237 references, and a 22 page appendix replete with illustrations of splints and appliances. Its 26 chapters cover the diagnosis, treatment, and industrial considerations of injuries of virtually every part of the body. Included also are the organization and equipment of industrial medical departments and two new chapters, one on strains and sprains, and the other on chemotherapy.

The foundation of this book is formed by the extensive experience of the author. He freely expresses his personal opinions and conclusions, the book abounding in brief, illustrative case reports. Though definitely a monograph, Dr. Lasher repeatedly refers to opinions and methods of others, reference always being made to the extensive bibliography appended. Medico-legal phases of injuries are discussed in ample detail, the exact scheduled awards of specific instances often being given. The com-

pensability of various ailments and injuries is given due prominence. Though no special section is devoted to them, the reader can readily locate, by use of the index, discussions on subjects such as osteomyelitis, burns, skin grafting, malingering, and amputations.

To include such a vast amount of material in one book is indeed noteworthy and, not realizing that all subjects are never covered with equal detail by any one author, some readers may wish for more discussion of certain subjects, for example: the treatment of compound fractures, the symptomatology of the protruded inter-vertebral disc, chronic sub-dural hematoma, the initial cleansing of burns, the use of plasma in shock, and the injection treatment of fibrositic areas.

The entire book is intensely practical. Not only is the whole field of industrial surgery covered, but detailed information is given (including illustrations) concerning treatment of all manner of injuries.

With industry geared toward a tremendous war effort, industrial surgery is a most vital subject. Therefore, not only to the industrial physician, but to the general practitioner as well, will this book hold great appeal.

FREDERICK W. SLOBE

**Developmental Diagnosis—Normal and Abnormal Child Development**—By Arnold Gesell and Catherine S. Amatruda. New York: Hoeber, 1941. 447 pp. Price, \$6.50.

The authors of this unique volume have brought together an enormous mass of material gathered from the Yale Clinic of Child Development and have organized it in such a practical manner as to be highly useful to clinicians and others concerned with normal and abnormal development of children. It carries forward the pioneer work of Arnold Gesell and his associates into a practical field.

The book is organized around three main sections, namely, Principles and Methods, Defects and Deviations of Development, and The Protection of Early Childhood Development, any one of which may be taken as a complete unit.

The authors consider Chapter III in Part I as "the most basic in the book, because it integrates the developmental tests, the behavior characteristics, and the growth trends of the behavior patterns for the period from four weeks to three years. This chapter is organized for convenient reference and is illustrated with over 100 photo-tracings of normative behavior patterns."

This volume cannot fail to have a profound influence upon methodology in the study of young children and upon the supervision of their health and development based upon exact and exhaustive observations.

*Developmental Diagnosis* is not a book of passing interest, but a volume of reference for some time to come.

RICHARD A. BOLT

*The Microbe's Challenge* — By Frederick Eberson, Ph.D., M.D. Lancaster, Pa.: Jacques Cattell Press, 1941. 352 pp. Price, \$3.50.

Dr. Frederick Eberson's book *The Microbe's Challenge* is one of the best and ablest versions of the story of bacteriology. It is completely unlike any of the previously published versions. Dr. Eberson is master of a happy style. At no time vulgar, his recitation reads smoothly and sustains interest from beginning to end. This work is a topnotch illustration of the thesis that competent popularization does not necessarily involve the sacrifice of factual truth or of good taste.

The book is a scholarly review of the history of the development of the signs of bacteriology. It is also a good "teaching work"; the reader of this book will not only learn to know but

also to understand the intricacies of bacteriology. The work brings the subject right down to the present day and includes such current matters as the viruses, bacteriophage, and experimental epidemiology.

The work has been composed, as the author states in his preface, from the point of view of *Microbes Versus Man*, and several times there is repeated in the text, Pasteur's grand hope "that it is within the power of man to cause all parasitic disease to disappear from the world." Time past, there was the hope that the science of bacteriology might offer the instrumentalities for this achievement. We now know that this hope was vain. The author so acknowledges it but, in this reviewer's opinion, not with sufficient emphasis. The belief that the primary cause of parasitic diseases is the parasite is open to serious challenge.

The weaker chapter in this otherwise excellent book is the 9th, entitled "Epidemics to Order." The author appears to have misread the studies of Greenwood, Webster, etc. These studies bear upon the dynamics of epidemics, that is, the propagation of epidemic diseases in herds of experimental animals living under artificial conditions. These studies do not illuminate the etiology of natural diseases of epidemic dimensions.

Apart from these minor criticisms *The Microbe's Challenge* is a work to be highly commended to health educators, public health workers, medical students, and to physicians. I know of no better summary of the subject matter.

IAGO GALDSTON

Vital Statistics of the United States, 1939—U. S. Department of Commerce, Bureau of the Census. U. S. Govt. Printing Office, Washington D. C., 1941. Part I—Place of Occurrence, 531 pp. \$1.50. Part II—Place of Residence, 283 pp. \$1.25.

Here we have the maximum of

economy and efficiency of presentation of our nation's births and deaths. The arrangement is logical and convenient, permits easy finding and use of the tabulated facts and rates based upon them. The introductory pages are adequately explanatory and, dealing as they do with the two major topics of natality and mortality by place of occurrence and place of residence separately, the text is more direct and comprehensive than in some earlier volumes. The natality and mortality data for the United States tabulated by place of occurrence and by place of residence, with supplemental tables for Hawaii, Puerto Rico, and the Virgin Islands, is a priceless addition to a shelf of equally precious predecessors.

These two volumes are more convenient to handle, save more lost motion and waste of eyesight than any of their predecessors, while presenting practically all the essential data other than such as may properly be classed as hand-picked and of a research nature. The supervision of Dr. Halbert L. Dunn, the Chief Statistician for Vital Statistics, is of itself a guarantee of the scholarship of the brief, succinct text and the authenticity of the tabular matter.

HAVEN EMERSON

**A History of Medical Psychology**  
—By Gregory Zilboorg, M.D. In collaboration with George W. Henry, M.D. New York: Norton, 1941. 606 pp. Price, \$5.00.

This book presents the story of man's interest in his own behavior and that of his fellows over a period from before the 4th century B.C. to the present time. Its chapters are entitled Primitive and Oriental Medical Psychologies; The Greeks and Romans; The Great Decline; The Restless Surrender to Demonology; The Blows of the Witches' Hammer; The First Psychiatric Revolution; The Age of Reconstruction; The Discovery of Neuroses; The Era of

Systems; The Second Psychiatric Revolution; Epilogue; Organic Mental Diseases; and Mental Hospitals. These pages present a tremendous amount of honest effort to portray the long, tedious and gloomy journey of metaphysics, psychology, psychiatry, and medicine toward an understanding of mental health and a humanistic tolerance of all its relationships to society and its problems of living. Aside from the objective of presenting a faithful background of historical facts the text develops in its progress that "although officially a branch of medicine, psychiatry was accepted into the brotherhood of medical efforts only on sufferance, only on the condition that it accept in advance the tenets of medicine and consider that disease means physical disease, and that mental disease be included in the organic realm of things." It is a truth that should be thought provoking.

This book should be in the library of every medical school and hospital as a valuable source of reference and collateral reading.

ESTHER LORING RICHARDS

**Professional Dentistry in American Society**—By Alfred J. Asgis, Ph.D., D.D.S. New York: Clinical Press, 1941. 260 pp. Price, \$4.50.

The author of this interesting book has given more than the usual consideration to the relation of the profession of dentistry to society at large. He brings into the forefront some of the responsibilities of one to the other, and suggests that dentistry as a profession must give a constantly increasing amount of thought to fulfilling its obligations to society, while, on the other hand, society must not overlook its responsibility to the profession.

In addition to urging society and dentistry to realize the necessity for shared responsibility and concerted effort, Dr. Asgis relates events which lead to the recognition of dentistry as a pro-

fession. The pattern and trend of past and present dental education are traced and its future discussed in a stimulating and thought provoking manner.

This book serves a useful purpose, and should be of particular aid to the non-dental health worker who may have an interest in or responsibility for the integration of dental activities in a general public health program.

BION R. EAST

**Determining Work Loads for Professional Staff in a Public Welfare Agency—***By Herbert A. Simon, William R. Divine, W. Myles Cooper, and Milton Chernin. Berkley: Bureau of Public Administration, University of California, 1941. 94 pp. Price, \$1.00.*

This is a nice bit of job analysis which so impressed the California State Relief Administration that part of the recommendations were put into practice. The major functions of the social workers in the local branches of the state organization are to determine eligibility for relief and to reinvestigate the eligibility of active cases. Their function was not to administer relief. The problem was to determine from the standpoint of efficiency and cost how large a case load should be given workers at different stages of the job. The more workers employed, the greater the operating expense. And yet with too few workers accuracy in approving eligibles was reduced, people stayed on relief longer than necessary, and the expenditure for relief clients was greater. Where is the desirable middle ground?

There are three distinct steps in the job. The first contact of the client is with the "qualifier" who after a prolonged personal interview approves or disapproves the application. Those approved go to the "field intake" group who check up the application by a home visit and approve or disapprove. And finally the "carrier" group periodically visits cases receiving relief to make

sure that the eligibility requirements have not changed.

The experiment was carried on in Los Angeles County with varying combinations of case loads at each of the three steps in the job. The outcome in terms of specific units indicates that a good initial interview is the most important. The case load of the "qualifier" should be kept low. The load on the "field intake" group could be stepped up. The load on the "carrier" should not be overdone.

These differences talk in dollars. In terms of total expense per 100 original applications there is a range from \$11,000 to \$15,000, depending on what combinations of load are placed on the three groups.

Administrative research of this kind has application in the field of public health. Public health nursing, sanitary and food inspection are suitable fields. At what point do checking and supervision yield returns disproportionate to the cost? This is a matter worth exploration.

GEORGE T. PALMER

**Everyday Nursing for the Everyday Home—***By Elinor E. Norlin, R.N., and Bessie Donaldson, R.N. New York: Macmillan, 1942. 306 pp. Price, \$2.50.*

*Everyday Nursing for the Everyday Home* is a very attractive title for a very timely and practical presentation of knowledge and skills of especial value to all families and home builders today. The authors are registered nurses with long and varied experience in private duty, hospitals, and public health nursing. For some years they have been teaching home nursing and health in the New York City high schools. At the request of the New York City Board of Education, they prepared a syllabus on home nursing and their book is based on this syllabus.

The book is divided into two parts. The first, approximately half of the total, deals with Nursing to Keep Well,

the second, with *Nursing When Illness Comes*. The material is presented in a very readable style and is supplemented by very simple and clear drawings and illustrations. The volume includes an excellent list of suggested readings of interest to any home maker and a splendid glossary is included.

It would seem to the reviewer that this publication will be of definite interest to home makers and to all students and teachers of home nursing.

MARION G. HOWELL

**Eye Hazards in Industry**—By *Louis Resnick*. Published for the *National Society for the Prevention of Blindness*. New York: *Columbia University Press*, 1941. 239 pp. Price, \$3.50.

The appearance of this book is timely in view of the increase in injuries due to industrial accidents during the last two years reported by such authorities as the Bureau of Labor Statistics and the National Safety Council. The book is divided into two parts: Part I poses the problem which is essentially the protection of the eyes of industrial workers from injury; Part II proposes ways and means to solve the problem.

In Part I are presented the facts concerning the nature and incidence of industrial eye injuries and their cost to the employer, employee, and the community.

In Part II the author presents most effectively a practical manual for the control of eye hazards in industry. Mechanical guards, goggles, and protective devices of different types are illustrated and explained. The rôle of process revision, education of employer and employee, and illumination of working stations in the prevention of visual injury is clearly set forth in succeeding chapters. The text closes with a brief outline of the importance and need of administrative supervision in the conservation of eyesight in industry.

The reviewer is impressed with the aims of the book and the fact that it is unique in the field. It is intended primarily for safety engineers, safety inspectors and others directly engaged in safety work concerned with conservation of vision. The author makes his fundamental point with the introductory statement that 300,000 eye injuries occur in American industries yearly, costing employers more than \$100,000,000 and injured workmen and their communities annually an equal sum. All but 2 per cent of this enormous economic loss with attendant physical disability and suffering is said to be wholly unnecessary.

As a whole the book is excellent and should be put into the hands of everyone in industry whose duties are in any way concerned with health and safety. The admirable chapters on preventive measures merit reproduction in cheaper form for distribution to small industrial plants where such material is most needed and where it may not otherwise penetrate.

BENJAMIN F. JONES

**Gynecology and Female Endocrinology**—By *Emil Novak, M.D., D.Sc. (Hon. Dublin), F.A.C.S.* Boston: *Little, Brown*, 1941. 605 pp. Price, \$10.00.

The author approaches his text with the viewpoint that gynecology is no longer to be considered as a branch of surgery inasmuch as the biologic aspects are so prominent. He thus omits operation details. The diagnosis and treatment are stressed from both anatomic-physiologic approaches. In his consideration of this field he attempts to limit his discussion to "straight" gynecology and female endocrinology. The latter may be a little confusing as the line of demarcation between male and female endocrinology is by no means clear.

The arrangement of material follows the stereotyped form common to most

texts. The chapter on anatomy presents nothing new. The discussion of history taking and physical examination is good and, of course, stresses the gynecologic viewpoint. The importance of a general study of the patient might have received more emphasis though it is brought out with reference to endocrinopathies. The anatomic grouping of diseases is endorsed rather than the recognition of disease processes which are now located here and again there.

The author manifests a wide familiarity with the literature, especially in the fields of pathology and endocrinology, and is perhaps inclined to be discursive. The illustrations are excellent and the author and publisher may well contemplate this work as a production worthy of them. In such a kaleidoscopic field as endocrinology is at present, it is not possible to have a book published which is up to the minute in all details. One who reads and studies this work could not help attain basic and clinical knowledge of great value.

FRED L. ADAIR

*Mental Hygiene for Community Nursing—By Eric Kent Clarke, M.D. Minneapolis: University of Minnesota Press, 1942. 262 pp. Price, \$3.50.*

In twelve chapters Dr. Clarke beautifully develops the thesis that each one's reaction to illness (and many times the illness itself) is but a natural part of his total life pattern, and that the community nurse is in the strategic position to give real help. The book is full of short case histories which commend themselves particularly as being "run of the mill" patients whom the nurse sees from day to day. The reviewer cannot remember another psychiatric product that is so nicely tuned to the group for whom it is written. Some of

the terms are pretty complicated for the amateur—but could not have been more adequately described without unjust lengthening of the text.

Everyone who reads the book must develop an interest in the *why* of the crankiness, the unreasonableness, the faith or hope of her patients. And that is at least half of the trick.

The book covers habit problems and many of the usual ones of the school child; it goes over the more common family conflicts; there is an excellent chapter on convalescents; the adolescent and the handicapped child each has a good chapter. The psychoneurotic is as hard to deal with in the book as in life—but Dr. Clarke sets up a clear picture of our limitations here. The chapter on what the community nurse can do for the psychotic and his family, is peculiarly good.

All in all, an excellent tilling of a new field by a man who knows his business.

JAMES S. PLANT

*Food Values of Portions Commonly Used—By Anna de Planter Bowes and Charles F. Church. (4th ed.) Philadelphia (311 So. Juniper Street): Anna de Planter Bowes, 1942. 35 pp. Price, \$1.00.*

This is the fourth edition of a well known manual which has been widely used by people who wish to have an easy reference book. The calculations have been brought up to date and include a table by the National Research Council, Committee on Foods and Nutrition. The tables are attractively put together and as usual make it quite easy to evaluate the actual intake in the usual dietary. It would be found useful by students in medicine, dentistry, public health, nursing and nutrition.

LEONA BAUMGARTNER

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

### Manifestations of Malnutrition—

As evidence that malnutrition among Americans is conspicuous by its absence, Clendening has reported that in his 10 years' experience at the Kansas City General only 3 cases of pellagra were seen. Well, here is a study made in comparable Ohio hospitals indicating that from 1 to 2 per cent of all medical admissions are pellagrins, and that the true incidence of pellagra, like other deficiency states, is underestimated.

BEAN, W. B., *et al.* The Incidence of Pellagra in Ohio Hospitals. J.A.M.A. 118, 14:1176 (Apr. 4), 1942.

**Schaeffer Method vs. Mechanical Resuscitation**—In these days when thousands are being taught the rudiments of first aid, any article on resuscitation is of wide interest. This one is a report of laboratory studies which indicate that rhythmic inflation and suction is definitely superior to manual artificial respiration, or rhythmic inflation.

BIRNBAUM, G. L., and THOMPSON, S. A. Resuscitation in Advanced Asphyxia. J.A.M.A. 118, 16:1364 (Apr. 18), 1942.

**Full Report on Sister Kenny's Treatment**—Observers who have seen poliomyelitis patients treated by the Kenny method are convinced that they are better off in (a) comfort, (b) freedom from deformity, (c) rapidity and extent of recovery, than are patients treated by conventional methods. This detailed report should be studied by all who may have any relationship whatever to the problem of polio control.

DALY, M. M. I., *et al.* The Early Treatment of Poliomyelitis. J.A.M.A. 118, 17:1428 (Apr. 25), 1942.

### Xerosis Conjunctivae, *et al.*—

Preclinical nutritional deficiency states as represented in tissue depletion, biochemical lesions, and altered physiology are more common and more important than the frank manifestations of nutritional failure. It is the early manifestations that public health and private physicians must understand in order that they may play their proper parts in the national campaign for better nutrition. This is a paper of immediate importance to all.

JOLLIFFE, N. Nutritional Failures: Their Causes and Prevention. Milbank Quart. 20, 2:103 (Apr.), 1942.

**Tuberculosis Takes on New Seriousness**—A negative tuberculin reaction is preferable in a non-tuberculized environment, a positive one in a tuberculized community. Primary and reinfection types of tuberculosis cannot be told apart for each may have certain features of the other. Hence, all newly discovered x-ray lesions must be treated as potential phthisis. These provocative answers to a series of pertinent questions on the epidemiology of tuberculosis, and their interpretations should be read by all.

MAYER, E., and RAPPAPORT, I. Present Key Problems in Tuberculosis. J.A.M.A. 118, 14:1179 (Apr. 4), 1942.

### What Four Cents Will Buy—

Four cents per capita was spent for venereal disease control in 1940. That is a sizable sum and for it we were



and still are getting a lot of syphilis prevention. How it was carried out in the several states is the gist of the excellent study.

MOUNTIN, J. W., and FLOOK, E. Distribution of Health Services in the Structure of State Government. *Pub. Health Rep.* 57, 16:553 (Apr. 17), 1942.

**Some Populations Are Phoenix-like**—America's population is fast approaching stationariness, city growth is slowing down, poorer classes multiply at greater rates than the well-to-do, the old age segment is greatly increasing. These four obvious phenomena affect almost every aspect of personal, social, and national life. The discussion paints a darksome picture, with just a ray of hope the value of which you may want to assess.

PANUNZIO, C. Population Trends in the United States. *Sci. Month.* 54, 4:353 (Apr.), 1942.

**All the Resources of Two Americas**—Nazis know the correlation between good nutrition and qualities of courage, stamina, and morale. They are applying it to the hilt, in reverse, to establish and maintain the repulsive Nazi dichotomy—slave caste and master race. America's task in defeating this design and healing the wounds of starvation when the war is won is portrayed in the most eloquent state paper these tired eyes have had the privilege to see.

PARPAN, T. Health Nutrition, and National Defense. *Canad. Pub. Health J.* 33, 3:99 (Mar.), 1942.

**Confidential Death Certificates**—Because so many people may see the death certificate between the time it is made out (in one Canadian Province) and the time it reaches the statistical offices of the Ministry of Health, a confidential death certificate is now in use. It is provided with a

sealable flap to cover the cause of death. There is evidence that a more accurate reporting of the cause of death has ensued since the change was made. About one in five were intentionally falsified or incomplete under the old system.

PARROT, P. The Use of the Confidential Death Certificate in the Province of Quebec. *Canad. Pub. Health J.* 33, 3:114 (Mar.), 1942.

**Building Malaria Out**—Experience in lining drainage ditches with monolithic concrete, pre-formed slabs and bricks is recounted.

ROBERTSON, J. L. Observations on Experimental Malaria Control Drainage Ditch Linings. *Pub. Health Rep.* 57, 13:451 (Mar. 27), 1942.

**Draftees in Two World Wars**—Syphilis, tuberculosis, mental disqualifications now are weeded out by modern diagnostic methods that were not available for use in the First World War draft. Then it was necessary to secure men quickly, train them hurriedly, transport them without loss of time. Now we are building an efficient army that can handle complicated equipment and we are wisely choosing the best men to do it.

ROWNTREE, L. G., *et al.* Health of Selective Service Registrants. *J.A.M.A.* 118, 14:1223 (Apr. 4), 1942.

**Respiratory Cross Infections Can Be Prevented**—Individual air conditioning of cubicles did not prevent respiratory infections in an infants' ward, but air conditioning with germicidal light barriers or glass barriers did prevent cross infections. Maintenance of light barriers is costly, the use of glass partitions a nuisance, and the installation expensive. So you take your choice.

SAUER, L. W., *et al.* Control of Cross Infections of the Respiratory Tract. *J.A.M.A.* 118, 5:1270 (Apr. 11), 1942.

**TB in the Dark**—Dried tubercle bacilli, depending upon the mass of the dose, survived in ordinary room light up to 5 days. In the dark some survived 3½ to 5 months. In the refrigerator they lived even longer. They lived longer in winter than in other seasons.

SMITH, C. R. Survival of Tubercle Bacilli. *Am. Rev. Tuberc.* 45, 3:334 (Mar.), 1942.

**Fluorides in the Water, Minerals in the Diet**—In a Texas county the incidence of caries is half the lowest

reported elsewhere and much below the average. Either the consumption of water containing fluorine or its application during cleansing, or both, must have been a contributory factor. Also there is a high phosphorus content to vegetable and animal products produced in the region. The incidence of caries was directly proportionate to *Lactobacillus acidophilus* in the saliva.

TAYLOR, E. Preliminary Studies on Caries Immunity in the Deaf Smith County (Texas) Area. *J. Am. Dental Assoc.* 29, 3:438 (Mar.), 1942.

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**NURSING HISTORY.** By Minnie Goodnow. 7th ed. Philadelphia: Saunders, 1942. 495 pp. Price, \$3.00.

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**HANDBOOK OF HYGIENE. FOR STUDENTS AND PRACTITIONERS OF MEDICINE.** By Joseph W. Bigger. 2d ed. Baltimore: Williams & Wilkins, 1941. 414 pp. Price, \$4.50.

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**THE FUNDAMENTAL PRINCIPLES OF MATHEMATICAL STATISTICS.** By Hugh H. Wolfenden. New York: Actuarial Society of America, 1942. 379 pp. Price, \$5.00.

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# ASSOCIATION NEWS

SEVENTY-FIRST ANNUAL MEETING  
ST. LOUIS, MO., OCTOBER 27-30, 1942

*Headquarters*  
MUNICIPAL AUDITORIUM

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 Joseph A. Salvato, Jr., M.C.E., 35 Market St., State Dept. of Health, Poughkeepsie, N. Y., Asst. District Engineer  
 Milo R. Simmonds, B.S., P. O. Box 462, Antlers, Okla., Asst. Sanitary Engineer, State Health Dept.  
 George E. Weant, Jr., B.C.E., 130 Maupin Ave., Salisbury, N. C., Junior Public Health Engineer, U. S. Public Health Service

*Maternal and Child Health Section*

- Dorothy A. Hansen, R.N., Box 337, Sitka, Alaska, Public Health Nurse, Territorial Dept. of Health  
 H. Close Hesseltine, M.D., 5848 Drexel Ave., Chicago, Ill., Asst. Professor of Obstetrics and Gynecology, Univ. of Chicago  
 Dr. Julie Palmieri, Morse St., Arroyo, Puerto Rico, Physician, Bureau of Maternal and Infant Hygiene, Puerto Rico Health Dept.  
 Benjamin Sachs, M.D., M.S.P.H., 30-24 Steinway St., Astoria, N. Y., Student, DeLamar Institute of Public Health

*Industrial Hygiene Section*

- Orlen J. Johnson, M.D., M.P.H., 535 N. Dearborn, Chicago, Ill., Field Worker, Council on Industrial Health, American Medical Assn.  
 Richard W. Schayer, B.S., State Board of Health, Jefferson City, Mo., Asst. Chemist, Div. of Industrial Hygiene, U. S. Public Health Service

*Food and Nutrition Section*

- Edith M. Cushman, M.P.H., 434 Edgewood Ave., New Haven, Conn., State-wide School Lunch Supervisor, WPA  
 Bryce Prindle, Ph.D., Iowa State College, Dept. of Bacteriology, Ames, Iowa, Teacher of Bacteriology  
 Frederick J. Stare, M.D., Barnes Hospital, 600 S. Kingshighway, St. Louis, Mo., Resident Physician

*Public Health Education Section*

- Cornelius M. Bowen, 36 Bogert Place, Westwood, N. J., Health Officer  
 Elizabeth E. Harvey, M.S.P.H., 935 Bonifant St., Silver Spring, Md., Health Educator  
 Clarence L. E. Monroe, Ph.D., 1613 W. Butler St., Philadelphia, Pa., Teacher of Hygiene, Morgan State College  
 Edwin S. Powell, State Board of Health, Columbia, S. C., Field Agent, Venereal Disease Control  
 Lillian B. Rumbaugh, B.A., 984 University Terrace, Reno, Nev., Secretary, State Hygienic Laboratory and Div. of Venereal Disease Control, State Health Dept.  
 Clarence G. Salsbury, M.D., Sage Memorial Hospital, Ganado, Ariz., Medical Director and Chief Surgeon

*Public Health Nursing Section*

- Thelma C. Ballard, Carroll County Health Dept., Huntingdon, Tenn., Junior Public Health Nurse  
 Edna Burke, 1003 Carona St., Denver, Colo., Asst. Supt., Denver Visiting Nurse Assn.  
 Ina M. Collins, R.N., Jasper County Health Dept., Webb City, Mo., Senior Staff Nurse  
 Lucille E. Corcoran, R.N., B.S., 845 Johnson Ave., Monterey, Calif., Public Health Nurse, U. S. Public Health Service  
 Beulah R. Daniel, R.N., F-5 Terrace Apts., Macon, Ga., Crawford County Public Health Nurse  
 Audrey R. Gallion, R.N., B.S.N., 1215 N.E. 4th St., Fort Lauderdale, Fla., Supervising Nurse, Florida Migratory Labor Health Assn.  
 Eileen M. Goodall, R.N., Box 942, 921 S. 4th St., Laramie, Wyo., County Public Health Nurse

Marjorie Kennedy, B.S., Lowndes County Health Dept., Columbus, Miss., Public Health Nurse, U. S. Public Health Service  
 Edna Kupferschmidt, R.N., City Hall, Div. of School Nursing, Dubuque, Iowa, City Nurse

Margaret Mallett, R.N., 6725 Harding Ave., Miami Beach, Fla., Public Health Nurse, Florida Migratory Labor Health Assn.

Mary E. McAuliffe, R.N., 305 Greenwood, Topeka, Kan., State Supervisory Nurse, State Board of Health

Edythe E. Payne, Reserve, N. M., Public Health Nurse, U. S. Children's Bureau

Mary A. Preston, B.S., Box 1500, Anchorage, Alaska, Junior Public Health Nurse, Anchorage Health Dept.

Elesa Simonson, R.N., B.N., Salmon, Ida., Lemhi County Nurse

Esther B. Smith, R.N., P. O. Box 732, Belle Glade, Fla., Visiting Nurse, Florida Migratory Labor Health Assn.

Anne M. Whalley, Box 1164, Kodiak, Alaska, Public Health Nurse, Territorial Dept. of Health

#### *Epidemiology Section*

Mabel S. Ingalls, Ph.D., Albany Medical College, New Scotland Ave., Albany, N. Y., Asst. Professor of Bacteriology

Nicholas Michelson, M.D., Jefferson County Health Dept., Birmingham, Ala., Surgeon (R), U. S. Public Health Service

Jose Rodriguez-Pastor, M.D., 8 Pershing St., Santurce, Puerto Rico, Chief, Bureau of Tuberculosis, Puerto Rico Health Dept.

Richard Scandalis, M.D., 116 Ferguson, Fallon, Nev., Field Physician, U. S. Indian Service

#### *Unaffiliated*

Karl W. Anderson, M.D., 430 Oak Grove St., Minneapolis, Minn., Chief Medical Officer, Northwestern National Life Insurance Co.

#### DECEASED MEMBERS

T. R. Crowder, M.D., Chicago, Ill., Elected Member 1905, Elected Fellow, 1922, Industrial Hygiene Section

M. Luise Diez, M.D., Boston, Mass., Elected Member 1926, Elected Fellow 1931, Maternal and Child Health Section

Clinton A. Kane, M.D., Elkton, Md., Elected Member 1926, Health Officers Section

Howard Morrow, M.D., San Francisco, Calif., Elected Member 1934, Health Officers Section

Henry G. Steinmetz, M.D., Lansing, Mich., Elected Member 1937, Health Officers Section

William H. Walsh, M.D., Chicago, Ill., Elected Member 1930, Industrial Hygiene Section

S. W. Wynne, M.D., New York, N. Y., Elected Member 1915, Elected Fellow 1924, Vital Statistics Section

#### CLOSING DATE FOR SUBMITTING FELLOWSHIP APPLICATIONS

**M**EMBERS who may be interested in applying for Fellowship in the A.P.H.A. are hereby advised that Fellowship applications should be received not later than August 1, to insure consideration at the 71st Annual Meeting.

**WANTED:** The following issues of the *American Journal of Public Health*—July and August, 1941; and January, 1942. The Association will be glad to pay postage.

## RATES QUOTED BY ST. LOUIS HOTELS

Seventy-First Annual Meeting, October 27 to 30, 1942

## AMERICAN PUBLIC HEALTH ASSOCIATION

ALL RATES QUOTED ARE FOR ROOMS WITH BATH  
ON EUROPEAN PLAN

<i>Hotel</i>	<i>Single</i>	<i>Double</i>	<i>Suites</i>
New Hotel Jefferson	\$3.00-5.00-6.00-7.00	\$6.00-7.00-7.50-8.00	\$12.00-20.00
Statler	3.00-3.50-3.75-4.00 4.25-4.75-5.00	5.25-6.00-6.25-6.50 6.75-7.00-9.00	17.00-18.00
American	2.00-2.50	3.50-4.00	
Claridge	2.50-3.00	3.50-7.00	
Coronado	2.25 (shower) 2.75	4.50-5.00	6.00
DeSoto	2.65-up	4.00-5.00	8.00
Lennox	3.50-4.00-4.50-5.00 6.00	4.50-5.00-6.00-7.00 8.00	10.50-14.50
Mark Twain	2.50-4.00	3.50-5.00-5.50	
Maryland	2.25-2.50-2.75	3.25-3.50-3.75-4.00 4.50	
(without bath)	1.75-2.00	2.75-3.00	
Mayfair	3.00-3.50-4.00-5.00	4.00-4.50-5.50-6.00 7.00	
Melbourne	2.65-3.20-3.70-4.20	4.20-4.80-5.30-5.80 6.20	
Park Plaza	4.50	6.00-8.00	12.00-18.00
Warwick	2.00-2.50-3.00	3.00-3.50-4.00-4.50 5.00	7.00-10.00

.....(Cut off on this line and mail to the hotel of your choice).....

HOTEL RESERVATION BLANK FOR THE ST. LOUIS MEETING  
AMERICAN PUBLIC HEALTH ASSOCIATION, OCTOBER 27-30, 1942To .....  
(Name of Hotel)Please reserve for me ..... rooms for ..... persons  
for the A.P.H.A. Meeting.

Single room ..... Double room .....

Maximum rate per day for room \$. ..... Minimum rate per day for room \$. .....

I expect to arrive ..... If date of arrival is changed I will notify  
you at least 24 hours in advance.

Please acknowledge this reservation.

Name .....

Street Address.....

City..... State.....

## EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York, N. Y.

### ARIZONA MERIT SYSTEM COUNCIL

The Merit System Council for the Arizona State Department of Social Security and Welfare and State Department of Health will probably shortly announce merit examinations for positions in those departments as follows:

State Director, Local Health Administration.....	\$350-400	
Director Maternal and Child Hygiene.....	350-400	
Director, Local Health Unit.....	350-400	and \$300-350
Health Officer-in-Training.....	300-350	
Director of Sanitary Engineering.....	300-350	
Sanitary Engineer .....	200-250	
Director, Public Health Laboratory.....	300-350	
Senior and Junior Bacteriologist-Serologist.....	165-215	and \$115-165 respectively
X-ray Technician .....	165-190	
Director Public Health Nursing.....	215-265	
Nursing Consultant, special fields.....	175-200	
Supervising Public Health Nurse, local unit....	175-200	
Senior and Junior Public Health Nurse, local unit	150-175	and \$125-150 respectively
Public Health Nurse-in-Training.....	100-125	
Director Health Education.....	215-265	
Nutrition Consultant .....	215-265	
Vital Statistician .....	175-225	
Medical Social Worker.....	165-190	
Child Welfare Consultant.....	200-250	

Competition is open on a nation-wide basis. Professional registration in Arizona required before appointment for certain classes. Closing date for receipt of applications will probably be about June 15.

Application blanks, information regarding qualification requirements, conditions governing filing of applications, and detailed descriptions of the various classes of positions may be secured from the Merit System Council, Room 208, Home Builders Building, Phoenix, Ariz.

### GEORGIA STATE MERIT SYSTEM ADMINISTRATION

The Supervisor of Examinations of the Georgia State Welfare Department announces competitive examinations for filling positions in the Public Assistance, Crippled Children, and Child Welfare Divisions. In the Crippled Children Division the salary ranges are minimum \$1,800, maximum \$2,280 for the position of Medical Social Worker, Orthopedic Field Nurse, and Physical Therapy Technician; for District Orthopedic Field Nurse a minimum of \$1,920, maximum of \$2,400; Physical Therapy Consultant a minimum of \$2,400, maximum of \$2,880; Orthopedic Nursing Consultant and Medical Social Consultant begin at a minimum of \$2,700 and range to a maximum of \$3,180; Medical Director of the Crippled Children Services begin at a minimum of \$4,200 with a maximum of \$5,400.

All of these positions are open to competitive assembled examinations except the Medical Director of the Crippled Children Services which is an unassembled examination. The examinations are based upon a rating of training and experience, a written test, and an oral interview. Each eligible who is appointed from the adequate register will be required to serve a probational period of 6 months as is the usual custom in Civil Service and Merit System agencies.

Georgia State residence is not required of an applicant in order to participate in the above examinations.

## U. S. CIVIL SERVICE COMMISSION

The Commission has announced unassembled examinations for Junior Public Health Nurse at \$1,800 a year and Junior Graduate Nurses at \$1,620 a year, under which the training and age requirements of announcements No. 88 and 103 of 1941 have been amended. Persons interested should communicate with the U. S. Civil Service Commission in Washington or obtain the amended announcements at any first or second class post office.

The Commission has announced that applications will be received for positions as Senior Medical Officer (\$4,600), Medical Officer (\$3,800), and Associate Medical Officer (\$3,200) for appointments in the Public Health Service, with the Food & Drug Administration, Veteran's Administration and the Indian Service. Forms for application may be obtained from the U. S. Civil Service Commission, Washington, D. C.

## PHYSICIANS NEEDED IN CANAL ZONE

The U. S. Civil Service Commission announces an examination to secure physicians for clinical service in the Panama Canal Zone. Graduation from a class A medical school subsequent to May 1, 1920, is required, and the applicant must be under 50, 25 to 35 years of age preferred. Entrance salary \$4,000. Persons interested should communicate with the U. S. Civil Service Commission, Washington.

## POSITIONS AVAILABLE

Physician with either public health training or experience in local health department administration to serve as health director in a county health department in mid-western state. Salary \$4,000 and \$500 travel (flat rate). Well established department with offices in attractive little city of 10,000. Write Box T, Employment Service, A.P.H.A.

Wanted: Trained Public Health Nurse, starting salary \$1,500 per year and traveling expense, increase to \$1,620 within 6 months. Saginaw County Health Dept., Saginaw, Mich.

Western state department of health will consider applications from physicians to fill four existing vacancies among county health officers, one vacancy in venereal disease control and positions as laboratory technicians. Write Box S, Employment Service, A.P.H.A.

County Public Health Nurses for New Mexico. Must have four months' post-graduate instruction under one of the recognized public health nursing courses and one year's experience. Must drive and have a car. Address inquiry to State Health Department, Santa Fe, N. M.

Position available—Deputy Commissioner of Health in mid-western city of 100,000. In writing give age, religion, training, experience and references. Write Box A, Employment Service, A.P.H.A.

## PUBLIC HEALTH ENGINEER

Responsible professional public health engineering involving field investigations and office studies in the application of sanitary measures. The more difficult

engineering and sanitation field surveys include supervision over public water supplies, sewerage systems and sewage treatment plants and review of plans for same, and promotion and supervision of sanitation programs. Minimum qualifications: Training and experience equivalent to 3 years' civil engineering experience, including 2 years in public health or sanitary engineering; or completion of an academic year of graduate study and a year's experience in sanitary or public health engineering; and graduation from a college of recognized standing with a major course in civil or sanitary engineering. The salary range is \$205 to \$250 per month depending upon experience. Apply Box E, Employment Service, A.P.H.A.

## OTHER VACANCIES

Southwestern state health department seeks 2 physicians for assignment to district health units, personally to conduct several small venereal disease clinics on a rotating schedule. Experience preferred but not required. Salary \$3,000, plus actual travel allowance not to exceed \$1,200. Write Box V, Employment Service, A.P.H.A.

The New Mexico State Department of Public Health will consider applications for the position of Assistant Director of the Maternal and Child Health Division. Address inquiries to the State Department of Public Health, Santa Fe, N. M.

Wanted: Trained Public Health Nurse, starting salary \$1,500 per year and traveling expenses. Increase may be expected within 6 months. Shiawassee County Health Department, Corunna, Mich.



Wanted: Nurse for county health work. Salary \$1,800 per year with travel allowance (additional) of \$500 per year. Address District Health Department 2, West Branch, Mich.

Instructor in Bacteriology, Medical School, large midwestern university, M.D. (or Ph.D. or D.Sc. in Bacteriology); Male. Salary \$1,800 to \$2,500 according to age and experience. Write Box D, Employment Service, A.P.H.A.

## POSITIONS WANTED

### ADMINISTRATIVE

Teaching or administrative position desired by physician, aged 48. Experienced teacher in preventive medicine and public health, now employed at prominent medical school; 20 years' experience in municipal health administration and epidemiology. A-491

Physician, B.S., M.D., and M.S.P.H., University of Michigan, aged 35, experienced city-county health administration and as director university student health service. Will consider permanent responsible position offering good income. A-492

Physician, aged 28; M.D. Rush; M.P.H. Harvard; seeks administrative position under first class supervision. A-496

### WOMEN PHYSICIANS TRAINED IN PUBLIC HEALTH

Woman aged 34, M.D., University of Basle, Switzerland, M.S.P.H. DeLamar Institute, Columbia University. U. S. citizen. Excellent references. Especially interested in industrial hygiene. A-493

Woman aged 41, M.D. Columbia University, M.S.P.H. DeLamar Institute, experienced in epidemiology and research, seeks position offering administrative experience. A-494

Woman physician, aged 48, M.D., University of Vienna. Excellent European pediatric experience. Seeks position in pediatrics, administration or statistical research. A-495

### HEALTH EDUCATION

Teacher and research worker, man, Ph.D., age 52. Extensive record as college professor of biology and hygiene and investigator, for the past two years engaged in research. H-499

Health Educator, Negro, man with background of High School administration and M.S.P.H. from University of Michigan, seeks position in Health Education. Public agency or educational field. Excellent references. H-497

Health Educator, M.A. in Education, 10 years' background in community organi-

zation for public health education, also teaching of personal and community health at high school and college levels. Public health nurse, able to teach mental and social hygiene as well as general health education. East preferred. H-498

Health Educator. Man with M.S. in preventive medicine and public health. Negro. Seeks position in Health Education or field work with official or non-official agency. H-500

Woman with master's degree in health education, 12 years' successful experience in public school and college teaching, administration and research. Will consider position in normal school, public schools, or in official or nonofficial health agencies. Prefers South or East. Available at once. H-501

### LABORATORY

Milk Sanitarian and Technologist, age 37, Ph.D., Bacteriology, Wisconsin, 10 years' experience in milk and food sanitation from industrial and official angle, seeks administrative position with opportunity for research or investigational work preferred. L-381

Chemist, Sc.D., Biochemistry, Johns Hopkins University. Age 31. Public health laboratory experience, teaching experience. Desires position with promise of advancement, preferably in commercial organization. L-461

Bacteriologist, young man 28, with B.S. in industrial science, experienced in newspaper work, salesmanship and now employed in state department of health laboratory, seeks position as bacteriologist or doing promotional work of public health nature. L-465

Bacteriologist, Ph.D. Teaching and laboratory experience in public health laboratory methods. Desires position with University, city or state health laboratory. L-466

### MISCELLANEOUS

Well trained ophthalmologist desires position in public health work. M-450

*Advertisement*

## Situations Wanted

**BACTERIOLOGIST**—A.B., Ph.D., state university; 6 years, university laboratory of animal pathology; 4 years, parasitologist, state department public health. PH6-1, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

**NURSE**—A.B. degree eastern college; graduate of school of nursing of university hospital; year's postgraduate training in public health nursing; is certified; nearly 15 years' executive experience in public health nursing; past several years, executive secretary, city health council; very superior woman

of broad and varied experience; has made distinct contribution to field of public health nursing. PH6-3, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

**PUBLIC HEALTH PHYSICIAN**—Degrees from leading schools; several years, field worker, well known foundation; 6 years, successful administrative experience; 8 years, health officer, large city in the South; will go anywhere. PH6-2, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

*Advertisement*

## Opportunities Available

**WANTED—INDUSTRIAL HYGIENIST**—Man with medical degree preferred but not required; new plant; staff consists of eight physicians and a complement of forty technicians, nurses, etc.; Mid-South. PH6-4, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

**WANTED**—(a) City physician; full-time appointment in midwestern town of 25,000; woman physician eligible; \$4,000. (b) Women physicians; public health appointment, pediatric background desirable; considerable traveling; Midwest. (c) Student health physician; young women's college; should be well qualified internal medicine and diagnoses; Midwest; immediately. (d) Health Commissioner, town of 105,000; Midwest. (e) Pediatrician; state public health staff, Midsouth. (f) Director; department of health and physical education; midwestern metropolis; excellent con-

nections. (g) Obstetrician and pediatrician for consultant appointments; state department of health; public health experience desirable but not required; women eligible. PH6-5, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

**PUBLIC HEALTH NURSES**—(a) Instructor and supervisor of public health and outpatient nursing service; department averages 12,000 patients monthly; duties teaching and administrative; degree required; large university hospital; West Coast. (b) School nurse for public schools in small city located in Chicago area; appointee must have car; minimum salary, \$150. (c) Student health nurse; girls' school located in Southern city; 9 months' appointment; \$1,300, maintenance. PH6-6, Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

## NEWS FROM THE FIELD

### THE TEACHING OF PUBLIC HEALTH AND PREVENTIVE MEDICINE TO MEDICAL STUDENTS

**HARRY S. MUSTARD, M.D.,** Chairman of a Committee on the Teaching of Public Health and Preventive Medicine of the Association of American Medical Colleges, recently presented a report for the information of the Committee on Professional Education of the American Public Health Association. The report is published in the March issue of the *Journal of the Association of American Medical Colleges*.

This committee was appointed originally at the suggestion of the A.P.H.A. Committee on Professional Education as a liaison between its Subcommittee on the Education of Medical Undergraduates, of which W. G. Smillie, M.D., is Chairman, and the Association of American Medical Colleges. The report summarizes findings and conclusions based on a questionnaire and opinions of the committee members, all of which will be discussed at the October meeting of the Association of American Medical Colleges.

Pointing to the wide diversity of opinion as to what should be included in a course of preventive medicine, the committee points out that this is relatively a new undertaking which faces an already overcrowded and not entirely elastic curriculum.

Believing that confusion in the terms "preventive medicine" and "public health" should be overcome, it is recommended that preventive medicine be regarded as that body of knowledge and those practices believed to contribute to the maintenance of health and the prevention of disease in either the individual or the aggregate. Correspondingly, public health is to be

regarded as that body of knowledge and those practices believed to contribute to health in the aggregate, either through preventive or corrective measures or both.

The committee records a striking increase in the number of full-time departments since 1935-1936 when FitzGerald classified 24 medical schools, 18 in the United States and 6 in Canada, as having such departments. There are now 32 full-time departments, 27 in the United States, 5 in Canada.

In 26 medical schools the committee finds that there are combined departments and that 13 schools have separate but not full-time departments.

The committee deprecates the tendency among instructors in preventive medicine and public health to visualize students as future health officers rather than as private practitioners of medicine interested and informed but not specializing in this subject.

The report continues:

That, regardless of extremes of radical and conservative opinion as to how the future of medicine may best be shaped, it be recognized that the demands of an enlarging public medical service, under one arrangement or another, will draw a much greater proportion of physicians than heretofore into government employment, on full-time, part-time, or fee basis, thus making them increasingly responsible for participating in organized preventive and corrective measures in the interest of the public health.

That it be recognized that qualifications for productive teaching in public health or for instruction in the mass aspects of preventive medicine are not likely to be acquired through training and experience in some other field of medicine, or to arise naturally as part of the ageing process.

That although it is entirely possible, in view of individual competence and personality, to utilize the part-time services of a health officer to direct a teaching department of public health, this should not be

regarded as a desirable procedure in ordinary circumstances.

That there continue in force the previously accepted standard of this Association, which sets aside for the teaching schedule of the department of preventive medicine and public health, 4 per cent of total curriculum hours available; that because in teaching preventive medicine and public health only minor use may be made of low salaried assistants and instructors, the budget for such a department should range from 5 to 8 per cent of the total instruction budget of the medical school.

Other members of the committee beside Dr. Mustard are John E. Gordon, M.D., Hugh R. Leavell, M.D., and Charles E. Smith, M.D.

#### NUTRITION FOUNDATION NAMES ADVISORY COMMITTEES

THE Nutrition Foundation, New York, N. Y., which has been organized by fifteen food manufacturers to study nutrition for the improvement of public health, has announced the membership of the scientific advisory committee. Included with this group are: F. G. Boudreau, M.D., New York; C. A. Elvehjem, Ph.D., Madison, Wis.; Icie M. Hoobler, Ph.D., Detroit, Mich.; P. E. Howe, M.D., U. S. Army, Washington, D. C.; E. V. McCollum, Ph.D., Baltimore, Md.; Lydia J. Roberts, Ph.D., Chicago; W. H. Sebrell, M.D., Washington, D. C.; Henry C. Sherman, Ph.D., New York, N. Y.; F. F. Tisdall, M.D., Toronto, Ont.; R. R. Williams, Ph.D., New York, N. Y.

Among the members of the food industries advisory committee are: Frederick C. Blanck, Ph.D., Pittsburgh, Pa., and James A. Tobey, Dr.P.H., New York, N. Y.

#### MICHIGAN COMMITTEE ON COMMUNICABLE DISEASE CONTROL

A COMMITTEE has been appointed, by Dr. Henry Allen Moyer, of Lansing, Michigan State Health Commissioner, to study the needs for the

control of communicable disease which have arisen as the result of the sudden influx of defense workers in certain areas of the state, particularly where no organized health department exists. Members of the committee are:

Frank Van Schoick, M.D., of Jackson—Representing the state medical society

Eldred V. Thiehoff, M.D., of Lansing—Representing the State Department of Health

Edgar E. Martmer, M.D., of Detroit—Representing the Michigan branch of the American Academy of Pediatrics

Lena Schermann, R.N., of Mason—Representing the Michigan State Nurses Association

G. Robert Koopman, of Lansing—Representing the Michigan Department of Public Instruction.

#### COUNCIL FOR EXPECTANT FATHERS

THE New Haven, Conn., Father's Council, sponsored by the local health department, marked its 5th anniversary on March 28 with the opening of the 11th series of meetings for expectant fathers. More than 400 men have attended these lectures during the past 5 years. On May 4 there was a joint meeting for fathers and mothers as part of the observance of National Child Health Week. Dr. Arnold Gesell, Professor of Child Hygiene and Director of the Clinic of Child Development at Yale University School of Medicine, New Haven, was the speaker.

#### FEWER AGENCIES REQUIRED

SPEAKING recently in Washington, Paul V. McNutt, Federal Security Administrator, said:

I believe it is sound public administration to work through the fewest agencies possible. If, however, there is an urgent task to do and no old line agency is willing or prepared to do it, the only alternative is to set up a new agency. Behind the recent multiplication of governmental agencies is a long history of official and neglected opportunities. I believe there are many lessons in this history which existing health agencies might well consider and in the light of which they might reconstruct their basic philosophy.

#### PAN AMERICAN CHILD CONGRESS DELEGATES FROM UNITED STATES

ON May 1, President Roosevelt designated eleven delegates representing the United States for the Eighth Pan American Child Congress, May 2 to 9 in Washington.

Headed by Katharine Lenroot, Chief of the Children's Bureau, as chairman, the United States delegation includes Dr. Frank G. Boudreau and the Right Rev. Mgr. Bryant J. McEntegart of New York; Jane M. Hoey, Dr. Edward O. Ernst, Bess Goodykontz, William G. Carr, Dr. M. O. Bousfield, Dr. Henry F. Helmholtz, Maria Pintado Rahn of the University of Puerto Rico, and Dr. Felix J. Underwood.

#### MALARIA CONTROL ACTIVITIES IN FLORIDA

FLORIDA has been designated a proving ground for the southeastern states in a national defense plan for malaria mosquito control activities. Leon County has been appointed for the trial defense malaria unit and U. S. Public Health officials in Atlanta, Ga., will collaborate. Dr. John E. Elmen-dorf, Jr., Pensacola, Director of the Bureau of Malaria Control, Florida State Board of Health, will supervise this program.

#### NATIONAL MATERNAL AND CHILD HEALTH COUNCIL SUSPENDS

BECAUSE of the lack of funds, it has been decided to wind up business and close the books of the National Maternal and Child Health Council (formerly National Council for Mothers and Babies), Washington, D. C., though the Council will continue as a corporation for the present, according to Mrs. Nathan Straus, Chairman of the Executive Committee.

Reporting that an effort to finance the Council through contributions from its constituent members had failed, Mrs.

Straus indicated that support from foundations was not assured and that for the present at least member agencies will themselves have to coordinate maternal and child health activities, and to bring help to desperately needy areas in the United States without the benefit of the Council.

#### U. S. PUBLIC HEALTH SERVICE MOVES ITS OFFICES

DURING March the headquarters of the U. S. Public Health Service on Constitution Avenue, Washington, across from the Munitions and Navy Buildings, was vacated by the Service which is now quartered in the old Naval Hospital at 23rd and E Streets.

Into the vacated building has moved the High Command of the United Nations.

#### NEW OFFICERS OF THE CONNECTICUT PUBLIC HEALTH ASSOCIATION

AT its recent Annual Meeting the Connecticut Public Health Association elected the following new officers:

*President*—Paul H. Brown, M.D., Stamford, Conn.

*President-elect*—Alfred L. Burgdorf, M.D., Hartford, Conn.

*Vice-President*—M. L. Palmieri, M.D., Middletown, Conn.

*Secretary-Treasurer*—Clement F. Batelli, M.D., New Haven, Conn.

*Representative to the Governing Council of the A.P.H.A.*—Joseph I. Linde, M.D., New Haven, Conn.

*Alternative Representative to the Governing Council of the A.P.H.A.*—Millard Knowlton, M.D., Hartford, Conn.

#### AMERICAN PHYSIOTHERAPY ASSOCIATION

THE American Physiotherapy Association has announced a conference to be held at Lake Geneva, Wis., June 28 through July 3 at which all organizations interested in physiotherapy will be asked to map their common problems and share in their solution.

Don W. Gudakunst, M.D., Medical Director of the National Foundation for Infantile Paralysis, Inc., New York, N. Y., has been designated A.P.H.A. representative to attend this conference.

#### NEW HEALTH UNITS IN NEBRASKA

THE Nebraska State Department of Health has established 3 new health units in defense areas: Cass-Sarpy County; Douglas County, including the city of Omaha; and Dodge-Saunders County. These units are established in connection with either army or defense production, and the personnel consists of medical officer, engineer, sanitarian, and 6 nurses.

### PERSONALS

#### Central States

PALMER O. EICHER, M.D., of Decatur, Ill., has been named Health Officer of Adams County.

CAREY P. MCCORD, M.D.,\* of Detroit, Mich., has been elected to extramural lectureship on occupational diseases at the new School of Public Health of the University of Michigan, Ann Arbor.

LEONARD R. MARTI, B.S., M.Ed., formerly State Health Administrative Officer for the National Youth Administration in North Dakota, has been appointed Acting Director of the Division of Health Education for the North Dakota State Department of Health, during the leave of absence of WILLIAM ROEMMICH, B.S., M.S., who is attending school at the Massachusetts Institute of Technology.

LAURA K. MCCRORY, Ph.B., who has been associate state director, Farm Security Administration for North Dakota, has been appointed Con-

sultant Nutritionist of the North Dakota State Department of Health. GEORGE F. MOENCH, M.D.,† of Marshall, has been appointed Director of the Calhoun County Health Department, Marshall, Mich., succeeding HUGH B. ROBINS, M.D., who is on leave for graduate work at the University of Michigan School of Hygiene and Public Health. Dr. Moench was formerly Director of the Delaware County Health Department, Delaware, Ohio.

JESSE E. NIXON, M.D., of Portland, Ind., has been named Health Officer of Jay County.

ROY OXENDALE, formerly Topeka representative of the United Press, has been appointed Director of a new unit established by the Kansas State Board of Health, Topeka, Kans. This Division on Public Health Information plans to extend lay educational programs pertaining to exhibits, movies, pamphlets, news releases and radio programs on public health.

CHARLES F. PECTOL, M.D., of Spencer, Ind., has been named Health Officer of Owen County.

IRA E. PERRY, of North Manchester, Ind., has been reappointed as Health Officer of Wabash County.

WALLACE S. PETTY, M.D.,\* formerly head of the Sioux City and Woodbury County, Ia., health units, has been appointed Director of Local Public Health Service for the State Department of Health, Lincoln, Neb. Dr. Petty recently completed a course in public health at the University of Minnesota, Minneapolis. He has been succeeded by DR. JOHN A. COWAN, who has been Acting Director of Public Health for Sioux City and Woodbury County.

ROLLA J. SHALE, M.D., M.S.P.H.,† Director of the Ontonagon-Baraga District Health Department, Ontonagon, Mich., has resigned to accept

\* Fellow A.P.H.A.

† Member A.P.H.A.

a position as Director of the Hillsborough County Health Department, Tampa, Fla.

MARY SOULES, M.D., Maternal and Child Hygiene clinician, North Dakota State Department of Health, is pursuing postgraduate work at the Harvard School of Public Health.

HENRY G. STEINMETZ, M.D.,<sup>†</sup> recently Health Commissioner of Genesee County, Mich., has been appointed Assistant Director in the Bureau of Venereal Diseases of the Michigan State Department of Health, Lansing.

LARS W. SWITZER, M.D.,<sup>†</sup> of Cassopolis, Mich., Health Officer of Cass County, will serve as Health Officer until the return of LESLIE V. BURKETT, M.D.,<sup>†</sup> of Flint, in June.

ARTHUR W. THOMAS, M.D., of Columbus, Ohio, Chief of the Division of Child Hygiene, Ohio State Department of Health, has been appointed Chief of the subdivision of child hygiene in the Cleveland Department of Health. Dr. Thomas succeeds RUDOLPH J. OCHSNER, M.D., of Cleveland, who has retired after 30 years' service.

HAROLD B. TURNER, M.D., of Bloomfield, Ind., has been named Health Officer of Greene County.

NEAL B. WILKINSON, Draftsman for the North Dakota Water Conservation Commission, has taken over the position of Draftsman, Sanitary Engineering Division, North Dakota State Department of Health.

#### Eastern States

WILLIAM STANLEY APPLIGATE,<sup>†</sup> of Asbury Park, N. J., was recently elected President of the New Jersey Health Officers' Association, succeeding HAROLD W. HAGER, of Ocean City.

DONALD B. ARMSTRONG, M.D.,\* Third Vice-president of the Metropolitan Life Insurance Company, New York, N. Y., in charge of Welfare Services for Policyholders, has been appointed a Senior Surgeon in the Reserve Corps of the U. S. Public Health Service.

LOUIS H. COHEN, M.D., of Norwich, Conn., has been appointed Assistant Clinical Professor of Psychiatry and Mental Hygiene at the School of Medicine, Yale University, New Haven.

MORRIS W. COWDEN, M.D., of Gerry, Chautauqua County, N. Y., was recently presented with a testimonial letter by EDWARD S. GODFREY, JR., M.D.,\* State Health Commissioner, "in recognition of fifty years of faithful and continuous service as health officer."

GEORGE B. DAVIS, M.D.,<sup>†</sup> of Milford, Conn., has been appointed as the first full-time Health Officer of Milford.

JOHN H. MUELLER, PH.D.,<sup>†</sup> Associate Professor of Bacteriology and Immunology, has been named Professor of Bacteriology and Immunology at the Harvard Medical School, Boston, effective July 1. He will take charge of the Department at the Medical School and at the School of Public Health.

SHERMAN S. PINTO, M.D.,<sup>†</sup> has been named Supervisor of Industrial Hygiene of the State Department of Health, New Orleans, La. Dr. Pinto is a graduate of the University of Nebraska College of Medicine, and has for some time been associated with the Massachusetts State Division of Occupational Hygiene, Boston, Mass.

ROY M. SEIDEMAN, M.D., DR.P.H.,<sup>†</sup> who has been Deputy Commissioner with the Cattaraugus County Department of Health, Olean, N. Y., has been appointed District Medical Officer for Civilian Defense under

\* Fellow A.P.H.A.  
† Member A.P.H.A.

the New York State Health Preparedness Commission, with offices in Rochester, N. Y.

RACHEL SPINNEY, a graduate in public health from the Massachusetts Institute of Technology and from the School of Public Health at the University of Michigan, has been appointed health education secretary of the Hartford Tuberculosis and Public Health Society, Hartford, Conn., succeeding HELEN MARTIKAINEN, who has resigned to enter the U. S. Public Health Service Staff.

DR. GEORGE S. STEVENSON, Medical Director of the National Committee for Mental Hygiene, has been elected President of the National Health Council, of New York, N. Y., for 1942. He succeeds KENDALL EMERSON, M.D.,\* Managing Director of the National Tuberculosis Association, who becomes Vice-President and Chairman of the Executive Committee.

RUTH HARTLEY WEAVER, M.D.,\* who has for several years been Registrar of Vital Statistics of Philadelphia, Pa., has been appointed Assistant Director of Health, succeeding the late Dr. Martha Tracy. Dr. Weaver has served as Epidemiologist of the City Department of Health and is Assistant Professor of Epidemiology and Vital Statistics at the Temple University School of Medicine, Philadelphia.

#### Southern States

ROSCOE P. KANDLE, M.D.,† of Monroe, La., has been appointed Director of the Calcasieu Parish Health Unit.

ELSA ORENT-KEILES, Sc.D.,† who recently has been connected with the department of biochemistry of the School of Hygiene and Public Health of the Johns Hopkins University,

Baltimore, Md., is Assistant Chief of the Food and Nutrition Division of the Bureau of Home Economics, U. S. Department of Agriculture, and in charge of the Nutrition Research Laboratories, Beltsville Research Center, Maryland.

CARL V. REYNOLDS, M.D.,\* of Raleigh, N. C., Secretary and State Health Officer of the North Carolina State Board of Health, was elected President of the State and Provincial Health Authorities of North America at their recent meeting in Washington, succeeding FREDERICK W. JACKSON, M.D.,† Deputy Minister of Health, Winnipeg, Man., Canada. Other officers are GREGOIRE F. AMYOT, M.D., D.P.H.,\* Provincial Health Officer, Victoria, B. C., Canada, Vice President; and ALBERT J. CHESLEY, M.D.,\* Secretary and Executive Officer, Minnesota Department of Health, Minneapolis, Minn., who was reelected Secretary and Treasurer for his 18th term.

#### Western States

CALVIN L. LONGSTRETH, M.D., has been appointed Health Officer for Bellingham, Wash.

#### DEATHS

T. R. CROWDER, M.D.,\* Director, Department of Sanitation and Surgery, Pullman Company, Chicago, Ill., died April 16.

SIR THOMAS OLIVER, British physician and author of many standard works on diseases afflicting industrial workers, died at Newcastle, England, on May 16, at the age of 89.

DR. ARTHUR PAUL WAKEFIELD, of Belmont, Mass., died February 6.

SHIRLEY W. WYNNE, M.D., New York City Health Commissioner from 1928 through 1933, died April 19, at the age of 59. He returned to private practice in 1934.

\* Fellow A.P.H.A.

† Member A.P.H.A.



## CONFERENCES AND DATES

- American Congress of Physical Therapy—21st Annual Scientific and Clinical Session. Hotel William Penn, Pittsburgh, Pa. September 9-12.
- American Home Economics Association. Boston, Mass. June 21-24.
- American Hospital Association. St. Louis, Mo. October 12-16.
- American Library Association. Milwaukee, Wis. June 21-27.
- American Medical Association—93rd Annual Meeting. Convention Hall, Atlantic City, N. J. June 8-12.
- American Medical Women's Association. Atlantic City, N. J. June 6-7.
- American Ophthalmological Society. Hot Springs, Va. June 1-3.
- American Public Health Association—71st Annual Meeting. Headquarters, Municipal Auditorium, St. Louis, Mo. October 27-30.
- American Public Works Association. Cleveland, Ohio. October 18-21.
- American Society of Civil Engineers—Summer Meeting. Upper Mississippi. July. Fall Meeting. New England. October.
- American Society of Clinical Pathologists. Philadelphia, Pa. June 5-7.
- American Therapeutic Society. Atlantic City, N. J. June 4-6.
- American Water Works Association—Annual Convention—Conference on War-time Water Works Problems. The Stevens Hotel, Chicago, Ill. June 21-25.
- Michigan Section—Park Place Hotel, Traverse City, Mich. September 9-11.
- Rocky Mountain Section—Frontier Hotel, Cheyenne, Wyo. September 17-18.
- Western Pennsylvania Section—Roosevelt Hotel, Pittsburgh, Pa. September 18.
- Minnesota Section—Lowrey Hotel, St. Paul, Minn. September 24-26.
- Four States Section—Benjamin Franklin Hotel, Philadelphia, Pa. October 7-9.
- Southwest Section—Little Rock, Ark. October 12-15.
- Kentucky-Tennessee Section—Irving Cobb Hotel, Paducah, Ky. October 19-21.
- Missouri Valley Section—Coronado Hotel, St. Louis, Mo. October 22-24.
- California Section—Hotel Oakland, Oakland, Calif. October 28-30.
- Civil Service Assembly—Eastern Regional Conference. Albany, N. Y. June 5-6.
- Annual Conference. St. Paul, Minn. October 1-3.
- Federation of Sewage Works Association. Cleveland, Ohio. October 15-17.
- Institute of Food Technologists. Minneapolis, Minn. June 15-17.
- Michigan Public Health Association. Grand Rapids. November 11-13.
- National Association of Public School Business Officials. Cleveland, Ohio. October 5-8.
- National Association of Social Workers—Delegate Conference. October.
- National Education Association. Denver, Colo. June 27-July 2.
- National Gastroenterological Association. Biltmore Hotel, New York, N. Y. June 3-6.
- National Institute for Traffic Training—5th Annual Institute. New Haven, Conn. June 15-26.
- National Noise Abatement Week. May 31-June 6.
- National Probation Association. Asheville, N. C. October 19-23.
- National Recreation Association. Cincinnati, Ohio. September 28-October 2.
- National Safety Council. Chicago, Ill. October 5-9.
- New Mexico Public Health Association. Raton. October.
- New York State Association of Milk Sanitarians—20th Annual Conference. DeWitt Clinton Hotel, Albany, N. Y. September 23-25.
- New York State Association of School Physicians—Annual Meeting and Conference. Grand Union Hotel. Saratoga Springs, N. Y. June 22.
- New York State Conference of Mayors and Other Municipal Officials. Syracuse, N. Y. June 8-10.
- New York State Sewage Works Association—Spring Meeting. Hotel Ten Eyck, Albany, N. Y. June 5-6.
- Special Libraries Association. Detroit, Mich. June 18-20.
- Tennessee Public Health Association. Nashville, Tenn. September.

## Canada

- Canadian Medical Association. Jasper Park Lodge, Jasper Park, Alberta, Sask. June 15-19.
- Canadian Public Health Association—31st Annual Meeting, in conjunction with annual conferences of the Ontario Health Officers Association and the Canadian Institute of Sanitary Inspectors (Ontario Branch). Royal York Hotel, Toronto, Ont. June 1-3.

# American Journal of Public Health

## and THE NATION'S HEALTH

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### The Costs of Rural Public Health Services<sup>\*</sup>

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Commissioner of Public Health, Nashville, Tenn.; and Executive Officer,  
State Board of Health, Jackson, Miss.*

THE purpose of this paper is to give some information on the cost of public health services as rendered in certain rather typical rural areas in two states. It is hoped that this report, based on a study made by the Mississippi and Tennessee State Departments of Health and the Commonwealth Fund, may have some value either in stimulating thought and study along this line or as an aid to administrators in program planning.

Cost data are usually developed in any field for one of two reasons: either to determine the relative monetary efficiency of particular services or methods, or to be used as the basis for the planning of new programs. The expansion of public health services in terms of the number of new units organized has been so rapid in the past few years that little attention has been given to the unit cost

of service and the relative costs of different services in a local public health program. Too frequently the procedure in organizing new units has been to say: here is a county which ought to have a health department; it could probably support one with state help; the population is so much; we can probably find money for a four, five, or six piece unit. Almost without exception staff and budget needs of the area have been underestimated and the wonder is that so many of these newly formed units have survived when the limitations of their budgets are considered.

In any construction work the amount of a particular element that goes into the job is determined after there has been a very careful consideration of the character of the job to be done. The cost of each element is then calculated on the basis of the local supply. If we are building a house we know how much must go into foundation, framing, plastering, finishing, plumbing, heating, lighting, painting, and so forth. But, I hear you say, suppose we want to build

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<sup>\*</sup> Read by Dr. Williams before the Health Officers Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 16, 1941.

<sup>†</sup> Dr. Walker died September 27, 1941.

a house for only \$5,000 or \$7,000 because that is all the money we have. We must still go back to the unit cost of materials in order to see where we may, by elimination, save the most money and still have a strong basic structure. There are some items that are essential and cannot be eliminated no matter what the cost; other items can be reduced in part without seriously hampering the purpose for which we are building, and still others can be eliminated entirely. This is equally true of public health programs or any other kind of public service endeavor.

The growth of certain phases of the public health program under the impetus of national propaganda, particularly the venereal disease service, has increased the amount of staff time and attention going into this field materially in practically every local health department in the last three years. Where there has been no corresponding increase in staff within the department this increase in attention to syphilis and gonorrhea has been made usually at the expense of other services. If we proceed on the assumption of a fixed budget and personnel as is so frequently the case, we must then ask ourselves whether the increased time spent on these services is in fact worth while. In some instances this increase of time is more apparent than real and because the tuberculosis program or the venereal disease program is being discussed by everyone and is uppermost in the mind, it is assumed that it takes an inordinate proportion of time whether it does or not.

Since the cost of personnel makes up the bulk of public health cost in an area, it is appropriate to begin any study of the cost of services with the distribution of time devoted to the various aspects of the public health program. During 1940, the field staff of 8 county health departments, 6 in Tennessee and 2 in Mississippi, kept time records on all services for the entire

year. Each member of the field staff made a note of the time when each service was begun and when it was finished. This was entered on the daily report form opposite the visit, inspection, or other service. From these notations a special record was made by each professional staff member showing the hours and minutes devoted to the various types of service on a particular day. These time reports contained items which pertained specifically to medical, nursing, dental, and sanitarian services. From these we may get the distribution of time of the professional personnel to the items in the public health program of the area. The professional hours devoted specifically to travel and other related activities have been prorated to the various services. The total cost of medical, nursing, or sanitation services includes not only salary and travel but also the cost of clerical time, general supplies, and overhead. The cost for clerical time, supplies, and overhead was prorated in accordance with the distribution of professional time.

The figure on total cost of medical, nursing, sanitation, and dental professional time per hour thus arrived at is set forth in Table 1 for the several counties. We note that the hourly cost of medical service varied from a low in Lincoln County of \$1.64 to a high in Pike County of \$2.35. In the Tennessee counties the medical costs are based upon full-time personnel. In the 3 small units there is the health officer working alone; in others, there are a health officer and one or more full-time assistants. In the Mississippi counties, the full-time medical personnel is assisted in clinical activities by part-time clinicians employed from the local group. The variation in the per hour costs of nursing service is due almost entirely to the fact that in some counties student nurses made a contribution and their annual rate of compensation is below that of the regular staff. The variation

TABLE 1

*Hourly Cost of Health Department Service by Size of Staff and by Type of Personnel, 1940*

	Medical	Nursing	Sanitation	Dental
Counties with small staff:				
Blount, Tenn.	\$1.83	\$1.01	\$1.11	....
Greene, Tenn.	1.89	1.05	1.05	....
Lincoln, Tenn.	1.64	1.11	1.13	....
Counties with large staff:				
Gibson, Tenn.	1.86	1.03	.96	....
Rutherford, Tenn.	2.09	1.00	1.15	....
Sullivan, Tenn.	2.07	.98	1.21	....
Lauderdale, Miss.	2.07	.92	1.25	\$1.23
Pike, Miss.	2.35	1.12	1.21	.86

in the per hour cost of sanitation personnel from \$.96 to \$1.25 seems to be due primarily to the consuming passion which the single sanitary inspector in Gibson County has for his job. He found approximately 20 per cent more time within the year for his official duties than was reported in other areas.

The cost of a particular service, such as communicable disease or venereal disease, was determined from the hourly cost for professional service and other expenditures. Special supplies, such as drugs for venereal disease clinics, films for tuberculosis, blue ribbons for the school program, maternity supplies for obstetrical nursing care, were charged to the particular service with which they

were associated. Where the laboratory work rendered locally for a particular service could be separated, it was charged to the service with which it was connected. A summation of these costs by services gives the distribution of funds from the local basic public health budget to the various services. The basic budget does not, however, usually include all the public health services which go into the program of the local community.

Though the basic budgets may include local, state, and federal funds, there are other expenditures going into the total cost of public health services. These include contributions by other public agencies in the community, such as civic

TABLE 2

*Amount and Percentage of Total Expenditures from Basic Budget and Other Sources by County, 1940*

	Small Staff			Large Staff				
	Blount	Greene	Lincoln	Gibson	Rutherford	Sullivan	Lauderdale	Pike
Population	41,294	39,512	31,569	44,835	33,637	69,535	58,384	35,072
Basic budget	\$11,474	\$11,823	\$11,236	\$31,720	\$31,534	\$34,558	\$42,640	\$30,021
Per cent	87.9	86.9	83.9	92.5	87.6	84.2	92.5	95.3
Other local agencies	....	420	420	120	131	45	....	....
Per cent	....	3.1	3.1	0.4	0.4	0.1	....	....
State services *	1,576	1,354	1,736	2,139	2,351	5,025	1,500	1,484
Per cent	12.1	10.0	13.0	6.2	6.5	12.3	3.3	4.7
Student services	....	....	....	300	1,350	100	1,952	....
Per cent	....	....	....	0.9	3.7	0.2	4.2	....
Voluntary medical	....	....	....	....	644	1,311	....	....
Per cent	....	....	....	....	1.8	3.2	....	....
Total	\$13,050	\$13,597	\$13,392	\$34,279	\$36,010	\$41,039	\$46,092	\$31,505

\* State services include: Laboratory cost, salary of clinicians, x-ray films, vaccines, syphilis drugs, and so forth.

clubs or by voluntary public health agencies, such as the tuberculosis association, services provided by the state for the community, which include diagnostic service for tuberculosis or venereal disease, laboratory service in a number of fields, and also biologicals supplied from state funds. Record forms and literature were supplied in these areas without cost and no attempt has been made to assign money value to these items. Similarly, there is voluntary professional work, particularly from physicians, in connection with school examinations or clinic services that is not included in the basic health department budget.

In Table 2 are shown the total expenditures for public health services in these 8 counties when the cost of services from all sources is included. It will be noted that these states made contributions in service rather than money, to local service, varying from \$1,354 to \$5,025. This is over and above any funds from state or federal sources contributed directly to the basic budget. In those areas in which a training program is carried on, as mentioned above, an appreciable amount of service is rendered by the students.

If we consider the percentage of total expenditures which is represented by state services in the small units, this amounts to from 10 to 13 per cent. In

the units with larger staffs and larger budgets, this is not such a large factor, varying from 3.3 to 6.5 per cent. In Sullivan County, however, a special venereal disease clinician supplied by the state on a part-time basis brings this item up to 12.3 per cent.

In Table 3, the percentage of total expenditures going into each service in each county is shown. It will be noted that the venereal disease program in 5 of the 8 counties takes either first or second place in terms of expenditures. In fact, when the total for the 8 counties is considered, the venereal disease expenditure, varying from \$2,526 to \$14,121, outranks other expenditures, and the cost of school services takes second place. In the two units with obstetrical nursing service, Gibson and Pike, this service is the most costly and venereal disease service second.

If we consider the average expenditures (Table 4) in these 8 counties as relatively typical of large and small units throughout the country, we see that of the \$229,000 spent for public health services in 1940, 22.8 per cent, or over \$52,000, was spent for venereal disease services; 15.8 per cent was spent for school hygiene services, 14.0 per cent for maternity hygiene, 11.9 per cent for infant-preschool, and 11.3 per cent for acute communicable disease control.

If we separate these counties into

TABLE 3  
Total Expenditures and Percentage by Service and by County, 1940

	Small Staff			Large Staff				
	Blount \$13,050	Greene \$13,597	Lincoln \$13,392	Gibson \$34,279	Rutherford \$36,010	Sullivan \$41,039	Lauderdale \$46,092	Pike \$31,505
Total expenditure								
Communicable disease	14.5	24.0	20.9	9.2	14.0	10.7	7.7	5.8
Venereal disease	21.7	18.6	15.2	21.2	12.5	34.4	25.2	22.3
Tuberculosis	12.5	9.1	15.1	6.2	8.7	10.5	3.5	4.1
Maternity	7.3	2.4	2.2	28.0	11.1	4.1	12.4	31.5
Infant-preschool	6.2	6.7	7.1	10.9	17.1	9.2	14.0	13.8
School	19.3	23.8	21.0	14.2	19.0	15.7	12.3	11.9
Adult hygiene	0.9	1.1	1.9	1.0	6.7	1.6	0.9	1.7
General sanitation	11.9	10.8	14.0	5.6	4.0	8.4	5.0	5.8
Food and milk	7.0	3.5	2.6	2.4	2.3	4.6	9.2	2.4
Student program	.....	.....	.....	1.3	4.6	0.8	9.8	0.7

TABLE 4

*Average Expenditure for All Services and Average and Percentage Expenditure for Each Service by Size of Staff, 1940*

	Average for All Counties		Average for Small Staff		Average for Large Staff	
	Amount	Per cent	Amount	Per cent	Amount	Per cent
Communicable disease	\$3,240	11.3	\$2,649	19.8	\$3,595	9.5
Venereal disease	6,523	22.8	2,551	19.2	8,905	23.5
Tuberculosis	2,162	7.6	1,618	12.1	2,489	6.6
Maternity	4,000	14.0	347	2.6	6,191	16.4
Infant-preschool	3,395	11.9	893	6.7	4,898	13.0
School	4,517	15.8	2,853	21.4	5,516	14.6
Adult hygiene	612	2.1	176	1.3	873	2.3
General sanitation	1,976	6.9	1,634	12.2	2,182	5.8
Food and milk	1,297	4.5	622	4.7	1,701	4.5
Student program	899	3.1	....	....	1,438	3.8
Average	\$51,131	100.0	\$13,346	100.0	\$37,785	100.0

those with five piece units and those with a more adequate staff, we see that the ranking of expenditures by services is materially changed. In the smaller units with less adequate staffs, the school program takes the largest expenditure, followed by acute communicable disease control, venereal disease control, general sanitation, and tuberculosis, in that order. In the counties with the larger staffs, the venereal disease program ranks first, followed by maternity hygiene, school, infant-preschool, and acute communicable disease, in that order.

Though the per capita cost of the various services is not the best unit for cost comparisons, it is one which is frequently used and for these 8 counties is set forth in Table 5.

There are some rather interesting modes indicated in this table. For example, an expenditure of 6 to 8 cents per capita for acute communicable disease control is usual. Expenditures of 6 or 7 cents for venereal disease control in small counties are common, but if there is a large urban population and a large clinic service it costs about 20 cents per capita. Counties with active tuberculosis programs spend from 6 to 9 cents for case finding and follow-up. Five piece units have relatively little time for the hygienes other than school hygiene, and spend little money in these brackets. About 10 cents per capita will do a fair job in maternity hygiene, but if a delivery service is included as a part of the program it will cost at least double this amount. It is common

TABLE 5

*Per capita Cost of Health Department Service by Type of Service and by County, 1940*

	Small Staff			Large Staff				
	Blount	Greene	Lincoln	Gibson	Rutherford	Sullivan	Lauderdale	Pike
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
Communicable disease	4.6	8.3	8.9	7.1	14.9	6.3	6.1	5.2
Venereal disease	7.5	6.4	6.5	16.2	13.4	20.3	19.9	20.0
Tuberculosis	3.9	3.1	6.4	4.7	9.3	6.2	2.7	3.7
Maternity	1.0	0.8	0.9	21.4	11.9	2.5	9.8	28.3
Infant-preschool	2.0	2.3	3.0	8.3	18.4	5.4	11.0	12.4
School	6.1	8.2	8.9	10.8	20.3	9.3	9.7	10.7
Adult hygiene	0.3	0.4	0.8	0.8	7.2	0.9	0.7	1.6
General sanitation	3.7	3.7	5.9	4.3	4.3	4.9	3.9	5.2
Food and milk	2.5	1.2	1.1	1.8	2.4	2.7	7.3	2.1
Student program	...	...	...	1.0	5.0	0.5	7.8	0.6
Total	31.6	34.4	42.4	76.4	107.1	59.0	78.9	89.8

TABLE 6

*Medical Cost and Percentage by Type of Service and by County, 1940*

Medical cost	Small Staff			Large Staff				
	Blount	Greene	Lincoln	Gibson	Rutherford	Sullivan	Lauderdale	Pike
	\$4,755	\$5,383	\$5,079	\$9,696	\$12,462	\$11,862	\$12,586	\$6,995
	Percentage							
Communicable disease	21.8	38.8	28.8	18.4	27.1	21.1	14.9	4.1
Venereal disease	37.2	26.1	24.7	47.0	15.2	44.6	47.7	58.8
Tuberculosis	14.1	7.9	15.2	7.5	9.2	15.3	3.7	6.4
Maternity	....	....	....	....	6.5	....	8.1	7.8
Infant-preschool	3.0	1.5	4.9	3.6	10.5	7.1	9.7	5.5
School	22.6	23.5	22.2	20.1	20.3	9.9	8.3	12.0
Adult hygiene	1.3	2.2	4.2	3.0	10.0	2.0	0.5	5.2
Student program	....	....	....	0.4	1.2	....	7.1	0.2

for counties to spend 10 cents per capita for school hygiene services. General sanitation can be financed at about 5 cents per capita and a reasonable food and milk control program at about 2.5 cents per capita.

In Table 6 are shown the total medical cost and the percentage of the expenditure for medical services in the various activities by county. The limitations of the medical staff in the five piece unit and its effect upon the distribution of medical service in some fields will be noted. In 5 of the 8 counties venereal disease service accounts for the largest proportion of medical expenditures. In the other 3 counties it is the acute communicable disease program. Though there is a rather striking uniformity of percentage of medical time devoted to school service by 5 of the 8 counties, the variation in this field is from 8.3 to 23.5 per cent. One would naturally expect a wide variation in the entire time

devoted to the acute communicable disease services, dependent upon the magnitude of the problem. The variation in the school service, however, must depend upon differences in program.

The total nursing cost and the percentage of total expenditures for nursing service allocated to the various activities are shown in Table 7. The expenditure for nursing service in these counties varies from about \$4,500 in the five piece unit to between \$18,000 and \$19,500 in the larger units. In the smaller staffs, the major emphasis is placed on the school program, which accounts for more than 25 per cent of the expenditure. In the 2 counties, Gibson and Pike, which carry on an obstetrical nursing program, the maternity service accounts for the greatest expenditure, amounting to between 40 and 50 per cent in each county.

The demands of the acute communicable diseases upon the small staffs are

TABLE 7

*Nursing Cost and Percentage by Type of Service and by County, 1940*

Nursing cost	Small Staff			Large Staff				
	Blount	Greene	Lincoln	Gibson	Rutherford	Sullivan	Lauderdale	Pike
	\$4,494	\$4,776	\$4,525	\$19,350	\$19,321	\$19,435	\$19,047	\$18,325
	Percentage							
Communicable disease	14.7	20.1	23.3	5.2	6.6	7.3	5.5	5.3
Venereal disease	17.2	14.7	8.2	9.3	10.3	31.0	14.0	13.4
Tuberculosis	15.3	14.3	17.7	5.3	9.2	9.4	4.2	4.4
Maternity	9.6	6.7	6.4	46.1	15.5	8.8	23.0	50.7
Infant-preschool	14.8	17.4	15.6	17.5	25.2	15.0	23.5	20.8
School	27.9	26.0	27.8	14.2	19.7	24.7	10.3	4.8
Adult hygiene	0.5	0.8	1.0	0.3	6.1	2.1	0.6	0.6
Student program	....	....	....	2.1	7.4	1.7	18.9	....

TABLE 8

*Sanitation Cost and Percentage by Type of Service and by County, 1940*

Sanitation cost	Small Staff			Large Staff				
	Blount	Greene	Lincoln	Gibson	Rutherford	Sullivan	Lauderdale	Pike
	\$2,628	\$2,591	\$2,624	\$2,808	\$2,601	\$5,454	\$6,613	\$3,030
	Percentage							
Communicable disease	0.1	....	1.6	....	4.2	....	0.4	0.1
School sanitation	7.2	26.9	14.7	3.9	16.2	6.5	11.5	12.5
General sanitation	56.6	55.6	71.0	67.4	51.4	62.6	30.3	60.2
Food and milk	36.1	17.5	12.7	28.7	24.9	30.9	57.3	20.7
Student program	....	....	....	....	3.3	....	0.5	6.5

indicated by the proportion of total nursing costs going into this field in the smaller counties, which varies in this group from 14 to 23 per cent, while those counties with more adequate staffs spend between 5 and 7 per cent of the total cost of nursing service in this field.

In Table 8 are shown the total expenditures for sanitation services in the counties and the proportion of these expenditures allocated to the various activities. In 7 of these counties the major expenditure is made on general sanitation; however, in Lauderdale County, with a 60 per cent urban population, the bulk of the expenditure is made on food and milk control. This county probably has more nearly completed its job of improving the sanitary condition than any of the others. This is due particularly to the fact that it has had a large staff of sanitarians over a period of years.

It will be recalled that these counties

received from \$1,500 to \$5,000 worth of service from the state departments which does not appear as a part of the basic budget. This represents from 3 to 13 per cent of the total expenditures. The percentage distributed to each service is shown in Table 9. It seems particularly significant that practically this entire expenditure in terms of service from the state department goes into communicable disease control either for the acute diseases, venereal diseases, or tuberculosis.

We may now carry our analysis of unit costs one step further and look at costs of field visits by nursing personnel in the various services. These are set forth in Table 10. The variations here are due to two factors: first, the variation from county to county in the average time devoted to a field visit in each service, and second, the basic cost of one hour of nursing time, which depends upon the salaries paid. It is clear that

TABLE 9

*State Expenditure and Percentage by Type of Service and by County, 1940*

State expenditures	Small Staff			Large Staff				
	Blount	Greene	Lincoln	Gibson	Rutherford	Sullivan	Lauderdale	Pike
	\$1,576	\$1,354	\$1,736	\$2,139	\$2,351	\$5,025	\$1,500	\$1,484
	Percentage							
Communicable disease	11.7	14.5	12.0	16.5	20.6	5.8	20.3	38.3
Venereal disease	34.5	53.9	23.3	40.3	32.0	66.7	67.8	28.8
Tuberculosis	46.4	29.0	62.9	41.1	7.3	23.0	11.2	25.2
Maternity	....	....	....	0.9	....	....	....	....
Infant-preschool	....	....	....	....	5.4	....	....	....
School	....	....	....	....	29.7	....	....	....
Adult hygiene	....	....	....	....	3.6	....	....	....
General sanitation	2.1	0.6	0.9	1.2	....	0.5	....	....
Food and milk	5.3	2.0	0.9	....	0.5	4.0	0.7	7.7
Student program	....	....	....	....	0.9	....	....	....



TABLE 10

*Cost per Nursing Visit by Type of Visit and by County, 1940*

	Small Staff			Large Staff				
	Blount	Greene	Lincoln	Gibson	Rutherford	Sullivan	Lauderdale	Pike
Field visit:								
Tuberculosis	\$ .90	\$ .88	\$ .63	\$ .56	\$ .72	\$ .61	\$ .40	\$ .72
Antepartum	1.88	1.53	1.23	1.58	1.47	1.34	.97	1.39
Postpartum	.83	.94	.83	.86	.81	.77	.78	.93
Infant	1.17	1.11	.58	.81	.90	.77	.58	.77
Preschool	.52	.69	.46	.51	.58	.47	.37	.50
School	.51	.56	.45	.38	.47	.53	.28	.41

the antepartum visit is the most expensive; that though there is considerable range of costs in some fields, others, like postpartum and school visits, do not vary much from county to county. In calculating these costs, not only the time spent in the actual making of visits but the time spent in travel and the cost of related activities, which it is believed contribute to the success of the visit, are also included.

Sullivan County and less in Lauderdale County than in any other. The high cost in Sullivan is due at least in part to the pneumothorax treatment clinic operated under supervision of the health department. This cost is more than 60 per cent medical in 6 counties. The school examination costs from \$.40 to \$.74. For the average small units it is 59 per cent medical and 41 per cent nursing. For the average large unit, it

TABLE 11

*Medical and Nursing Cost per Clinic Visit by Type of Service and by County, 1940*

	Small Staff			Large Staff				
	Blount	Greene	Lincoln	Gibson	Rutherford	Sullivan	Lauderdale	Pike
Syphilis clinic:								
Medical time	\$ .66	\$ .77	\$ .64	\$ .52	\$ .56	\$ .31	\$ .26	\$ .73
Nursing time	.29	.39	.19	.21	.59	.36	.12	.44
Total	\$ .95	\$1.16	\$ .83	\$ .73	\$1.15	\$ .67	\$ .38	\$1.17
Tuberculosis clinic:								
Med. time, local	\$ .59	\$1.01	\$ .29	\$ .41	\$1.26	\$1.55	\$ .44	\$ .36
Nurs. time, local	.93	1.68	.90	.66	.75	1.79	.32	.64
Med. time, state	1.53	1.76	1.51	.99	.18	1.34	.29	1.09
Med. time, voluntary	....	....	....	....	.19	.74	....	....
Total	\$3.05	\$4.45	\$2.70	\$2.06	\$2.38	\$5.42	\$1.05	\$2.09
School examination:								
Medical time	\$ .28	\$ .29	\$ .35	\$ .32	\$ .49	\$ .25	\$ .26	\$ .53
Nursing time	.18	.25	.21	.14	.25	.20	.14	.14
Total	\$ .46	\$ .54	\$ .56	\$ .46	\$ .74	\$ .45	\$ .40	\$ .67

In Table 11 is shown cost of certain clinic services. In calculating these costs, medical and nursing time have been used but no item has been included for drugs used in the syphilis clinic or x-ray films in the tuberculosis clinic. It will be noted that the total cost of the syphilis clinic visit varies from \$.38 to \$1.17. Tuberculosis clinics cost more in

is 70 per cent medical and 30 per cent nursing.

In Table 12, the cost per inspection of private premises, food handling establishments, and dairy farms is set forth. The inspections of food handling establishments are given for only 3 counties, as the number reported by the others was negligible.

TABLE 12

*Cost per Inspection by County and by Type of Service, 1940*

	<i>Private Premises</i>	<i>Dairy Farm</i>	<i>Food Establishment</i>
Counties with small staff:			
Blount	\$ .62	\$1.78	....
Greene	.71	1.52	....
Lincoln	2.09	2.05	....
Counties with large staff:			
Gibson	.61	1.96	....
Rutherford	1.75	2.10	....
Sullivan	.72	1.77	\$1.89
Lauderdale	1.38	3.02	.51
Pike	1.70	2.22	.85

Lauderdale County in 1940 reported 8,617 dental inspections of school children. The cost for this service was 8.9 cents per inspection. Pike County reported 2,496 such inspections at a cost of 21.3 cents per inspection.

We may conclude that program emphasis will and probably should shift and that these distributions of costs will change accordingly. From these analyses, one preparing a budget for a local health department may judge the amount of money needed for certain services. There is no indication that these are the best distributions, but they do represent the cost in representative counties.

From this analysis of time and cost spent in various health department activities in these 8 typical rural counties it seems that:

The basic budget of the health department represents only from 83.9 to 95.3 per cent of the total expenditures.

The cost per hour of medical service varies from \$1.64 to \$2.35; nursing service from \$.92 to \$1.12, and sanitation service from \$.96 to \$1.25.

Field time represents less than half the cost of field and clinic visits.

Time of examination represents less than half the cost of school examination.

In more than half the counties, syphilis clinic service ranks either first or second in expenditures.

In small units, the school service takes from 26 to 28 per cent of the total expenditure for nursing service.

From 23.3 to 67.8 per cent of the money spent for state service is chargeable to the syphilis control program.

The antepartum visit is the most expensive and ranges from \$.97 to \$1.88.

The cost of a syphilis clinic visit ranges from \$.38 to \$1.17; a tuberculosis clinic visit from \$1.05 to \$5.42, and a school examination from \$.40 to \$.74.

NOTE: Details of both time and cost figures are available at the Commonwealth Fund, 41 E. 57 St., New York, N. Y., and will be sent to anyone who desires additional information.

# Diphtheria Immunization with Fluid Toxoid and Alum-Precipitated Toxoid\*

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THE purpose of this study was to investigate the height and duration of the antitoxin response following injection with fluid or alum-precipitated toxoid. When the study began in 1936, immunization against diphtheria was attempted largely by one injection of alum-precipitated toxoid, or two or three injections of fluid toxoid. It was felt to be highly desirable to determine which of these was the method of choice. The most conclusive study would have been a comparison of the resistance to actual exposure to diphtheria following the different immunizing procedures. Since the low incidence of diphtheria made this impossible, it was decided that the next most valuable study would be a comparison of the antitoxin response and the durability of that response.

## METHODS

The study has been carried out on 2,487 free-living children from rural schools and communities in Saginaw County, Mich., a county of about 1,110 square miles.

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The immunity response has been followed by blood serum titrations alone. No Schick tests were used because the Schick test itself has an antigenic effect, especially on a child with circulating antitoxin in its blood. Eliminating the Schick test made it possible:

1. To observe the comparative antitoxin response to the various immunizing procedures alone.
2. To follow the duration of the response without giving additional secondary stimulations.
3. To determine the responses to be expected in routine immunization when the Schick test is not used. The decreasing use of the Schick test made this important.

Therefore, before giving any antigenic stimulation, the children were bled. Four or five ml. of blood were taken in vacuum tubes (Keidel or Kimball). Each child was bled again 4 months after the first injection and at 12 months and every 12 months thereafter for the duration of the study.

The blood was titrated essentially by the method of Fraser.<sup>1</sup> The clotted blood was centrifuged at approximately 1,200 r.p.m. for 1 hour, the serum drawn off aseptically, and stored at 2-10° C. The serum of children not previously immunized was first tested to determine if it contained more or less than 0.001 unit of antitoxin per ml. by comparing the reactions in the skin of a rabbit on the intradermal injections of the following mixtures:

Serum Control	0.2 ml. serum + 0.2 ml. saline
Test of Serum for 0.001 Unit	0.2 ml. serum + 0.2 ml. toxin dilution
Standard Control	1.0 ml. N.I.H. antitoxin + 1.0 ml. toxin dilution

The antitoxin in the standard control was the standard diphtheria antitoxin of the National Institute of Health. This was diluted 1:10 with 66 per cent neutral glycerine, in which dilution it keeps indefinitely in the cold. It was then made up to 1:6,000 with saline just before use. At this dilution 1 ml. contained 0.001 unit. The same toxin (No. 358) was used throughout the study and was diluted 1:6,700–1:7,200, varying a little with each new bottle. The optimum toxin dilution was determined by mixing several dilutions of the toxin with each of four dilutions of the National Institute of Health standard antitoxin, namely, 0.001 unit per ml., 0.002 unit per ml., 0.004 unit per ml., and 0.01 unit per ml. That dilution of toxin was chosen which showed the greatest difference in size between the reactions—usually that dilution which gave a + reaction on injection of the 0.001 unit mixture, a  $\pm$  reaction to the 0.002 unit, and a negative reaction to the 0.004 and 0.01 unit mixtures. The toxin dilution was always added to the serum, the tubes were shaken, and allowed to stand  $\frac{1}{2}$  hour at room temperature. The syringes were filled while waiting, and the intradermal injections of 0.1 ml. of the mixtures made within a second  $\frac{1}{2}$  hour period. Clipped white rabbits were used, weighing from 5 to 8½ pounds. Forty-eight injections were placed on each rabbit, including six control injections, three at the front and three at the back. Readings were made on the 3rd and 4th day after injection by comparing the size of the reactions with those of the control injections. The reactions on the front half of the rabbits were compared with

the controls on the front half, and those on the rear half with the rear controls.

If the serum proved to contain more than 0.001 unit it was retitrated, using the following dilutions:

0.01 Unit	0.1 ml. serum + 0.9 ml. saline A
0.1 Unit	0.2 ml. A + 1.8 ml. saline B
1.0 Unit	0.2 ml. B + 1.8 ml. saline

After this titration determined the range in which the titer fell, the serum was again tested. The units tested for in the study were:

0.002	0.02	2.0	16.0
0.004	0.04	4.0	32.0
0.01	0.1	8.0	

The toxin was diluted for all mixtures in Fraser's buffer diluent which has the following formula:

Sorensen's borate—boric acid buffer  $\left\{ \begin{array}{l} 12.404 \text{ gm. H}_3\text{BO}_3 \\ 100 \text{ ml. N NaOH} \\ \text{Water to 1 liter} \end{array} \right.$

To one liter add 818.1 ml. 0.1 N HCl to pH 7.9

$\left. \begin{array}{l} 1,070 \text{ ml. buffer pH 7.9} \\ 36.4 \text{ gm. NaCl} \\ 2,210 \text{ ml. H}_2\text{O} \end{array} \right\} \begin{array}{l} \text{Autoclave 1 hour} \\ \text{at } 120^\circ \text{ C.} \end{array}$

0.85 gm. gelatin  $\left. \begin{array}{l} \text{Autoclave 1 hour} \\ \text{at } 120^\circ \text{ C.} \end{array} \right.$

Add gelatin and sterile H<sub>2</sub>O to make 4,280 ml. after autoclaving.

The following procedures were used in immunization of children:

1. 1 injection of fluid toxoid
2. 2 injections of fluid toxoid (3 weeks apart)
3. 3 injections of fluid toxoid (3 weeks apart)
4. 1 injection of alum-precipitated toxoid
5. 2 injections of alum-precipitated toxoid (3 weeks apart)

The toxoid used was obtained from a commercial firm by Dr. W. T. Harrison of the National Institute of Health so that it would be representative of toxoid generally available. The alum-precipitated toxoid was prepared from the fluid toxoid used in the study. This was felt to be important because of the possibility that two different preparations of toxoid might vary in some in-

trinsic antigenic efficacy for which we have no method of determination. The National Institute of Health tests showed the fluid toxoid to contain 20 L<sub>r</sub> per ml. and the alum-precipitated toxoid to stimulate production of an average of 2-4 units of antitoxin in guinea pigs in the National Institute of Health control test for alum-precipitated toxoid. On the re-resolution of the alum-precipitated toxoid it was likewise found to contain 20 L<sub>r</sub> per ml. These tests were repeated and verified by the Michigan Department of Health.

A diphtheria carrier survey was carried out in the schools during the study. Throat cultures were taken at intervals from all the school children, irrespective of whether they had received immunizing injections. The throat cultures were examined by the Bureau of Laboratories of the Michigan Department of Health according to the following procedure:

Inoculate a tellurite plate and a Loeffler's plant with the specimen submitted. Incubate at 37° C. for 18-24 hours. Prepare smears from the Loeffler's slant and stain with Loeffler's methylene blue. If diphtheria-like organisms are found, re-incubate the tellurite plate for another 24 hours. Subculture typical colonies to Loeffler's medium and incubate 24 hours at 37° C. Wash off the growth with 2.0 ml. of tryptose broth. Inoculate 1 ml. subcutaneously into the abdominal wall of a guinea pig weighing 250-300 gm., and 1 ml. into a control pig of equal weight which has been previously injected intraperi-

toneally with 500 units of diphtheria antitoxin.

Autopsy pigs at death or at the end of 72 hours. Consider any cultures as toxigenic if the unprotected guinea pig exhibits edema, necrosis at site of inoculation, and hemorrhagic suprarenals, and the protected control guinea pig is normal at the end of the test period. Consider any culture as non-toxic if both pigs are normal at autopsy.

The carrier survey was felt to be essential to the evaluation of the antitoxic response obtained by the various immunizing procedures because one might expect a much higher antitoxin response in a locality with a high carrier rate of virulent diphtheria organisms and a lower response in a locality where exposure to virulent diphtheria organisms is a rarity.<sup>2</sup>

#### RESULTS

There are several reasons why the results of this study may be considered indicative of a safe minimum response to be expected from each of the immunizing procedures studied. They are:

1. The children were free-living children from 150 rural schools and their vicinities. A higher antigenic response might be expected from urban children or institutional children.
2. The children were living in a low diphtheria environment as shown by the results of the carrier survey (Table 1) and the incidence of diphtheria (Table 2). A higher response would be expected in the presence of a higher carrier or diphtheria rate.
3. The children were living in a northern state. Children in a southern state might be expected to give a greater antigenic response.<sup>3</sup>

TABLE 1  
Saginaw County Diphtheria Survey  
(Total Number of Cultures Taken: 31,363)

Time	Number of Children	Number of Children with Positive KL Culture		Number of Children with Pathogenic KL Culture		Number of Children with Non-pathogenic KL Culture		Number of Children with Positive KL Culture (No Virulence Test Made)	
		Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
1916-1940	13,693	121	0.86	35	0.25	72	0.51	14	0.10

TABLE 2

Incidence of Diphtheria						
Year	Cases of Diphtheria	1936	1937	1938	1939	1940
		4	3	0	0	0
						0

TABLE 3

*Age Distribution of Children in the Study*

Age	1 A.P.	2 A.P.	1 Fluid	2 Fluid	3 Fluid	1 Fraser	2 Fraser	3 Fraser	Tit. No. Toxoid	Total	Per cent
8 mo.	1	1	1	..	..	..	..	..	..	3	....
1 yr.	5	4	..	2	..	..	..	..	..	11	....
1½ yr.	2	2	..	2	..	..	..	..	..	6	....
2 yr.	7	2	3	3	6	1	..	1	1	24	....
3 yr.	10	5	2	8	6	..	..	1	2	34	....
4 yr.	38	12	2	19	18	1	..	2	1	93	....
5 yr.	94	75	13	51	70	9	6	66	2	386	....
Total	157	101	21	85	100	11	6	70	6	557	22.3
6 yr.	153	123	22	110	158	6	3	65	..	640	....
7 yr.	131	77	8	70	84	1	1	24	4	400	....
8 yr.	89	51	10	31	59	1	..	10	4	255	....
9 yr.	57	50	6	34	62	..	..	4	..	213	....
10 yr.	31	25	5	31	36	..	..	..	2	130	....
Total	461	326	51	276	399	8	4	103	10	1,638	65.9
11 yr.	20	9	2	14	31	..	..	2	..	78	....
12 yr.	23	13	3	20	27	..	..	..	..	86	....
13 yr.	14	4	3	15	19	..	..	..	1	56	....
14 yr.	13	2	7	8	14	..	..	..	..	44	....
15 yr.	6	..	2	2	5	..	..	..	2	17	....
16 yr.	6	..	1	..	..	..	..	..	..	7	....
17 yr.	4	..	..	..	..	..	..	..	..	4	....
Total	86	28	18	59	96	..	..	2	3	292	11.8
Grand Total	704	455	90	420	595	19	10	175	19	2,487	100.0

The fact that 65.9 per cent of the children were 6 to 10 years of age, and 22.3 per cent were in the preschool age group (Table 3) makes the results of the study directly applicable to routine immunization against diphtheria, since these are the age groups usually concerned.

For part of the study, alternate children in a group were given two different immunizing procedures in order to have

a strictly controlled comparison. These were called "Controlled Groups." For the rest of the study, different immunizing procedures were used in alternate schools or communities. These are listed as "Uncontrolled Groups" (Table 4).

It is evident that the results are comparable between the "Controlled" and the "Uncontrolled" groups when the responses of those children having less than 0.001 unit of antitoxin at the time

TABLE 4

*Comparison of Antitoxin Response to the Different Immunizing Procedures in Controlled and Uncontrolled Groups*  
(Antitoxin level at time of 1st injection  $<0.001$ )

Immunizing Preparation and Procedure	Group	Four Months			Twelve Months		
		No. in Group	Children with 0.001 or More		No. in Group	Children with 0.001 or More	
			No.	Per cent		No.	Per cent
2 Injections fluid	Controlled	129	82	63.5	33	55	62.5
2 Weeks apart	Uncontrolled	31	20	64.5	23	12	52.1
1 Injection A.P.	Controlled	116	105	90.5	101	86	85.1
	Uncontrolled	236	222	94.0	226	199	88.0
3 Injections fluid	Controlled	113	113	100.0	..	..	....
3 Weeks apart	Uncontrolled	49	46	93.8	49	47	95.9
2 Injections A.P.	Controlled	138	138	100.0	..	..	....
3 Weeks apart	Uncontrolled	10	10	100.0	..	..	....



TABLE 6

*Comparison of Antitoxin Levels in a Group of Children Having Three Injections of Fraser's Fluid Toxoid (0.5 ml.-0.5 ml.-1 ml.) in Children Having < 0.001 Units of Antitoxin at the Time of Injection*

	Kind of Toxoid	No. of Children	Units of Antitoxin per One ml. of Serum											
			< 0.001		0.001 < 0.004		0.004 < 0.01		0.01 < 0.04		0.04 < 0.1		0.1 Plus	
			No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent	No.	Per cent
Four Months	Fraser	139	18	13	12	9	26	19	39	28	24	17	20	14
	U.S. P. H. S. Toxoid	428	21	5	53	12	57	13	132	31	71	17	94	22
	Total	567	39	7	65	11	83	15	171	30	95	17	114	20
Twelve Months	Fraser	127	13	10	8	6	21	17	37	29	19	15	29	23
	U.S. P. H. S. Toxoid	417	41	10	62	15	63	15	111	27	54	13	86	21
	Total	544	54	10	70	13	84	15	148	27	73	13	115	21

of injection are compared. This suggests that, in studies on free-living children with no history of previous diphtheria immunization, it may not be necessary to have strictly controlled groups using alternate children if the children having less than 0.001 unit of antitoxin are used and if the diphtheria environments are similar. Since the results with the two groups are similar, they are combined in the rest of the paper to simplify presentation.

The antitoxic response of all children having less than 0.001 unit of antitoxin per ml. of circulating serum at the time of the first immunizing injection is given in Table 5. The response is analyzed at three different antitoxin levels; that is, in terms of the number and percentage of children developing 0.001 unit or more, 0.01 unit or more, or 0.1 unit or more of antitoxin per ml. of circulating serum.

The results in Table 5 indicate that:

1. Under the conditions of this study, two injections of alum-precipitated toxoid or three injections of fluid toxoid at 3 week intervals cause the highest and consequently the most lasting antitoxic response.

2. One injection of alum-precipitated toxoid is superior to 2 injections of fluid toxoid.

3. The immunizing procedure which raises the most children from no detectable anti-

toxin to a detectable level also raises the most children to higher antitoxin levels.

4. Some antitoxin response may be under way within 10 days of an injection of either alum-precipitated or fluid toxoid. This is in accord with the observations of Jensen.<sup>4</sup>

Table 5 reemphasizes the increased antigenic efficiency conferred by the alum-precipitation of toxoid, since the average antitoxin response to a single injection of alum-precipitated toxoid is so much greater than that to either one or two injections of fluid toxoid.

Fitzgerald, et al.,<sup>5</sup> and Fraser and Halpern<sup>6</sup> observed an increase in antitoxin following injection of alum-precipitated toxoid comparable to those we are reporting. They observed a much greater response to 3 injections of fluid toxoid than we found. In an attempt to solve this discrepancy, a group of children were injected at 3 week intervals with 0.5, 0.5, and 1.0 ml. of fluid toxoid.\* The resulting antitoxin response of children having less than 0.001 unit of antitoxin at the time of injection is shown in Table 6. It is evident that the results with the Fraser toxoid and dosage was comparable to

\* Obtained from the Connaught Laboratories through the cooperation of Dr. Fraser.



TABLE 7  
Comparison of Antitoxin Response to the Different Immunizing Procedures  
(All Cases Having 0.001 Unit or More at the Time of Injection)

Immunizing Procedure	No.	4 Months			12 Months			2-4 Months			3-6 Months			4-8 Months			6-10 Months		
		No.	%	Number of Cases	No.	%	Number of Cases	No.	%	Number of Cases	No.	%	Number of Cases	No.	%	Number of Cases	No.	%	Number of Cases
1 Injection	No.	104	100	104	104	100	104	104	100	104	104	100	104	104	100	104	104	100	104
1 ml. Fluid	%	65	63	100	65	63	100	65	63	100	65	63	100	65	63	100	65	63	100
2 Injections	No.	104	100	104	104	100	104	104	100	104	104	100	104	104	100	104	104	100	104
1 ml. Fluid	%	65	63	100	65	63	100	65	63	100	65	63	100	65	63	100	65	63	100
3 Injections	No.	104	100	104	104	100	104	104	100	104	104	100	104	104	100	104	104	100	104
1 ml. Fluid	%	65	63	100	65	63	100	65	63	100	65	63	100	65	63	100	65	63	100
1 Injection	No.	126	116	97	119	114	90	80	68	54	79	66	51	62	52	41	27	21	16
1 ml. A. P.	%	98	92	77	98	83	67	70	57	41	87	60	44	96	84	66	83	69	48
2 Injections	No.	71	70	65	66	65	64	57	56	45	30	29	25	25	22	19	14	14	14
1 ml. A. P.	%	99	99	92	99	99	97	86	86	64	30	29	25	45	41	28	48	48	48

that obtained in the rest of the study with fluid toxoid in three 1 ml. doses at 3 week intervals. We again did not obtain the high antitoxic response observed by the Canadian workers. We are unable to explain the discrepancy.

The response to the different immunizing procedures of all children having 0.001 unit or more at the time of injection is analyzed in Table 7.

As was to be expected, the response of these children to all immunizing procedures was excellent. There is a suggestion that fluid toxoid is more effective than alum-precipitated toxoid in boosting the antitoxin level where detectable circulating antitoxin already exists. This is only of academic interest, since the immunizing of the non-immune is the important problem. The actuality of this difference could not be gauged unless the results were analyzed on the basis of the amount of antitoxin present at the time of the first injection. Table 8 gives a comparison of the response of those children having 0.001 to 0.004 units of antitoxin at the time of injection.

Although the numbers are of necessity small, Table 8 does carry the same suggestion as Table 7 that fluid toxoid causes a better response than alum-

precipitated toxoid when antitoxin is already present in a detectable amount. It is also interesting to note that even when 0.001 to 0.004 unit of antitoxin is present, three doses of fluid toxoid cause a better response than two, and two doses of alum-precipitated toxoid cause a better response than one.

It can be seen that there is little difference in the response of the different age groups to the immunization procedure used. It is important to know that the response of the preschool group is as good as any other, since this is the most important group to immunize from the standpoint of lowering the diphtheria mortality rate. Blum<sup>7</sup> likewise found the response of children in the age group 2-4 to be excellent following tetanus antitoxin immunization, but reported that those in the age group 1-2 gave a lower response.

There were no reactions of an allergic nature. From a total of 1,614 injections of alum-precipitated toxoid, two definite abscesses (both sterile) and two reactions suspicious for abscesses were observed. Three of these were in children having less than 0.001 unit of antitoxin and in one having 0.1 unit of antitoxin at the time of the first alum-precipitated injection. We attribute these to technic.

TABLE 8

*Response of Children Having 0.001 to <0.004 Units at Time of Injection*

		4 Months		1 Year		2 Years		3 Years		4 Years	
		Number of Cases	Cases with 0.1 Unit or More	Number of Cases	Cases with 0.1 Unit or More	Number of Cases	Cases with 0.1 Unit or More	Number of Cases	Cases with 0.1 Unit or More	Number of Cases	Cases with 0.1 Unit or More
2 Injections 1 ml. Fluid	No.	13	10	12	7	11	5	9	5	4	2
	%	..	77	..	58	..	46	..	56	..	50
3 Injections 1 ml. Fluid	No.	22	19	23	20	18	16	10	9	..	..
	%	..	86	..	88	..	89	..	90	..	..
1 Injection 1 ml. A. P.	No.	27	13	30	10	32	6	24	2	20	1
	%	..	48	..	33	..	19	..	8	..	5
2 Injections 1 ml. A. P.	No.	16	14	14	10	15	10	10	7	..	..
	%	..	88	..	82	..	67	..	70	..	..

TABLE 9

Response of Children in Different Age Groups to the Various Immunizing Procedures  
(All Children Having <0.001 Unit at Time of Injection)

Age Group	Immunizing Procedure		4 Months			1 Year			2 Years			3 Years		
			Number of Cases	Cases with 0.001 Unit or More		Number of Cases	Cases with 0.001 Unit or More		Number of Cases	Cases with 0.001 Unit or More		Number of Cases	Cases with 0.001 Unit or More	
Under 2 Years	3 Injections	No.	3	3	3	2	2	2	2	2	2	..	..	..
	1 ml. Fluid	%	..	..	..	..	..	..	..	..	..	..	..	..
	1 Injection	No.	1	1	1	1	1	1	..	..	..	..	..	..
	1 ml. A. P.	%	..	..	..	..	..	..	..	..	..	..	..	..
	2 Injections	No.	3	3	3	4	4	4	4	4	4	..	..	..
	1 ml. A. P.	%	..	..	..	..	..	..	..	..	..	..	..	..
2 to 5 Years	3 Injections	No.	118	114	82	121	116	89	67	62	46	28	27	20
	1 ml. Fluid	%	..	97	69	..	96	74	..	93	69	..	96	71
	1 Injection	No.	54	51	38	57	53	36	69	66	35	53	44	10
	1 ml. A. P.	%	..	94	70	..	93	63	..	96	51	..	83	19
	2 Injections	No.	68	67	67	63	63	58	67	67	62	..	..	..
	1 ml. A. P.	%	..	100	99	..	100	92	..	100	93	..	..	..
6 to 10 Years	3 Injections	No.	328	314	236	324	305	206	247	221	143	122	117	67
	1 ml. Fluid	%	..	96	72	..	94	64	..	89	58	..	96	55
	1 Injection	No.	206	199	123	205	192	109	214	191	84	209	179	68
	1 ml. A. P.	%	..	97	60	..	94	53	..	89	39	..	86	32
	2 Injections	No.	230	230	221	218	218	204	200	199	170	..	..	..
	1 ml. A. P.	%	..	100	96	..	100	94	..	99	85	..	..	..
11 Years and Over	3 Injections	No.	55	51	43	53	49	37	43	38	27	14	12	10
	1 ml. Fluid	%	..	93	78	..	92	70	..	88	63	..	86	71
	1 Injection	No.	16	14	6	10	8	4	15	10	7	9	5	3
	1 ml. A. P.	%	..	87	37	..	80	40	..	67	47	..	56	33
	2 Injections	No.	10	10	10	12	12	12	11	11	9	..	..	..
	1 ml. A. P.	%	..	100	100	..	100	100	..	100	82	..	..	..

DISCUSSION

This study was concerned solely with the antitoxin response to different immunizing procedures. No attempt is made to prove that any one procedure is the procedure of choice for routine immunization against diphtheria, for two reasons:

1. The ultimate basis for the evaluation of any immunization method is whether or not it protects against diphtheria, and not necessarily whether or not it confers Schick negativity or raises the antitoxin level to any definite point.

2. It is entirely possible that a procedure which results in a lower level of antitoxin than some other may still be the method of choice from the public health standpoint; that is, it might be less expensive, be easier to administer, and confer a high enough percentage of immunity to be the most efficient use of the public health dollar in prevention of diphtheria. It may be a question of choosing between the conferring of the highest possible immunity to the individual on the one hand, and the reduction of diphtheria by conferring a lower

but sufficient level of immunity to the community as a whole on the other.

This study emphasizes the comparatively poor antitoxin response to two injections of fluid toxoid with a 3 week interval and justifies the discontinuance of this procedure for immunization against diphtheria.

This study suggests that the Schick test may be omitted in routine immunization. Certainly there is nothing to be gained by the pre-Schick test in the preschool group—and it is doubtful whether there is any reason to Schick test following two injections of alum-precipitated toxoid or three injections of fluid toxoid until the child enters school—and then, as indicated in the subsequent paper,<sup>8</sup> a single injection of fluid or alum-precipitated toxoid would be more logical.

#### SUMMARY

The antitoxin response of children to several diphtheria immunization procedures has been determined. In the decreasing order of the response they induce in children having less than 0.001 unit of antitoxin per ml. of serum at the time of injection, they are, under

the conditions of our study: two doses of alum-precipitated toxoid at 3 week interval, three doses of fluid toxoid at 3 week interval, one dose of alum-precipitated toxoid, two doses of fluid toxoid at 3 week interval, and one dose fluid toxoid.

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# Reimmunization Against Diphtheria of Previously Immunized Children\*

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SEVERAL years ago, the Committee on Administrative Practice of the American Public Health Association suggested the reimmunization of previously immunized children as a means of maintaining a high antitoxin level and so extending immunity to diphtheria for an additional period of years.<sup>1</sup> In the following report, observations are made on the reimmunization of a group of 808 children who had been immunized 1 to 12 years previously.†

The objects of the study are:

1. To determine the immunity status of a group of children who previously had received immunizing injections.

2. To determine the immunizing effect of one, two, and three doses of fluid toxoid or one or two doses of alum-precipitated toxoid on previously immunized children.

3. To determine whether previously im-

munized children who at the time of reimmunization have no demonstrable antitoxin would respond better to a single injection than children without demonstrable antitoxin but with no history of previous immunization.

4. To determine whether the reactions from reimmunization with fluid or alum-precipitated toxoid were severe enough to discourage the practice of reimmunization.

Blood antitoxin titration tests instead of Schick tests were used to determine the immunity status and the immunological response.

The details of methods used in immunization and titration are given in a previous paper.<sup>2</sup>

The entire group consisted of 808 children who had been immunized previously. The years in which they had been immunized and the number of children immunized each year are shown in Table 1.

TABLE 1  
Year of Original Immunization

Year of Original Immunization	1928	1929	1930	1931	1932	1933	1934	1935	1936	1937	1938	1939	1940	Unknown
Number in Group	2	6	20	50	80	56	93	75	152	70	121	51	14	18

\* Read at a Joint Session of the Laboratory and Epidemiology Sections of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, October 17, 1941.

† Throughout the paper, the terms "immunization" and "reimmunization" have been used to mean "the primary giving of antigenic stimulation" and "the secondary stimulation after a lapse of several years" respectively. This was done to simplify the presentation. It is realized that all injected children are not necessarily immunized.

The preparations used in the original immunization were:

Toxin-antitoxin  
Concentrated Toxoid  
Fluid Toxoid  
Toxoid with Alum Added  
Alum-precipitated Toxoid

TABLE 2

*Antitoxin Titer Levels at the Time of Reimmunization, and the Reimmunizing Agent Used*

Antitoxin Titer at Time of Reimmunization	Total Number	Number Reimmunized with	
		Alum-Precipitated Toxoid	Fluid Toxoid
Less than 0.001 unit per ml.	432	265	167
More than 0.001 unit per ml.	376	197	179

TABLE 3

*Age Groups at Time of First Immunization*

Age (Years)	Under 1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Unknown
Per cent	3	3	5	8	7	15	26	16	8	5	2	0.9	0.4	..	0.1	2.6

As will be shown later, the results of reimmunization were uniformly good. It follows therefore that the nature of the primary immunization has little effect upon reimmunization response. For this reason the analysis of the reimmunization response has been made without reference to the original immunization preparation or procedure.

A few of the children had received Schick tests soon after their primary immunization treatment. Changes in the immunity of these individuals were noted by comparing the results of the Schick tests made soon after the original immunization with blood titration tests made at the time of reimmunization.

Out of the total of 808 children who had been previously immunized (this total includes both those with and without Schick tests), there were 432 or 53 per cent who had less than 0.001 unit of antitoxin per ml. of serum in their circulating blood at the time of the reimmunization injections, leaving the balance of 376 with 0.001 unit or more.

Table 2 shows the antitoxin levels at the time of reimmunization and the reimmunizing agent given.

Table 3 indicates the age of children at the time of the first immunization. It shows the majority as being 5, 6, and 7 years old.

Eight hundred and eight children were reimmunized as follows:

Fluid	Alum-Precipitated Toxoid
1 Injection: 0.1 ml.	1 Injection: 0.1 ml.
0.5 ml.	0.5 ml.
1.0 ml.	1.0 ml.
2 Injections: 1.0 ml.	2 Injections: 1.0 ml.
at 3 week intervals	at 3 week intervals
3 Injections: 1.0 ml. at 3 week intervals	

Table 4 indicates the age of children at the time of reimmunization. It shows the majority as being from 7 to 11 years old.

A comparison of antitoxin response to different immunization procedures is made in Tables 5-8. Table 5 represents a group of individuals who originally had *less than* 0.001 unit of antitoxin at the time of reimmunization. Table 6 shows a comparison of reimmunization response to a single dose of fluid and a single dose of alum-precipitated toxoid, all children having *less than* 0.001 unit at the time of reimmunization. Table 7 represents a group which had 0.001 unit

TABLE 4

*Age Groups at Time of Reimmunization*

Age (Years)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Number Given A. P. Toxoid	..	..	..	3	11	26	55	53	68	78	57	43	26	27	8	7	..
Number Given Fluid Toxoid	..	..	..	1	14	17	29	30	47	68	52	26	33	18	10	..	1

TABLE 5  
Comparison of Antitoxin Response to the Different Reimmunizing Procedures (432 Children)  
(All Cases Having  $\leq 0.001$  Unit at the Time of Injection)

Reimmunizing Procedure	No. of Cases	4 Months			1 Year			2 Years			3 Years			4 Years			5 Years		
		Cases with 0.001 or >	Cases with 0.01 or >	Cases with 0.1 or >	Cases with 0.001 or >	Cases with 0.01 or >	Cases with 0.1 or >	Cases with 0.001 or >	Cases with 0.01 or >	Cases with 0.1 or >	Cases with 0.001 or >	Cases with 0.01 or >	Cases with 0.1 or >	Cases with 0.001 or >	Cases with 0.01 or >	Cases with 0.1 or >	Cases with 0.001 or >	Cases with 0.01 or >	Cases with 0.1 or >
1 Injection 1/10 ml. Fl.	No.	75	50	17	12	75	0	12	12	12	12	12	12	12	12	12	12	12	12
1 Injection 1/5 ml. Fl.	No.	89	85	55	12	55	12	12	12	12	12	12	12	12	12	12	12	12	12
1 Injection 1 ml. Fl.	No.	90	86	55	12	55	12	12	12	12	12	12	12	12	12	12	12	12	12
2 Injections 1 ml. Fl.	No.	11	7	6	12	75	0	12	12	12	12	12	12	12	12	12	12	12	12
3 Injections 1 ml. Fl.	No.	14	14	13	12	11	8	6	6	6	6	6	6	6	6	6	6	6	6
1 Injection 1/10 ml. A.P.	No.	43	43	25	15	14	8	10	21	20	11	52	52	11	52	11	52	11	52
1 Injection 1/5 ml. A.P.	No.	131	125	90	15	15	8	16	36	32	24	4	4	31	28	16	4	4	4
1 Injection 1 ml. A.P.	No.	49	48	30	40	48	16	36	36	32	24	4	4	31	28	16	4	4	4
2 Injections 1 ml. A.P.	No.	24	24	16	23	23	6	20	20	20	15	5	5	13	13	0	2	2	2
2 Injections 1 ml. A.P.	No.	100	96	67	100	87	26	100	100	75	25	25	25	100	69	13	13	13	13

TABLE 6

*Summary of the Comparative Reimmunization Response 4 Months After a Single Injection of Fluid or Alum-Precipitated Toxoid (All Children Having Less than 0.001 Unit of Antitoxin at Time of Reimmunization)*

Immunizing Procedure	Total Number of Children	Antitoxin Titer		
		0.001 Unit or > per ml. per cent	0.01 Unit or > per ml. per cent	0.1 Unit or > per ml. per cent
0.1 ml., 0.5 ml., or 1.0 ml. Fluid Toxoid	122	86	79	48
0.1 ml., 0.5 ml., or 1.0 ml. A. P. Toxoid	228	97	94	64

or more of antitoxin at the time of reimmunization.

As shown in Table 5, observations were made on 432 children having less than 0.001 unit of antitoxin at the time of reimmunization. It can be seen that as little as 0.1 ml. of either fluid or alum-precipitated toxoid produced a significant antigenic response in previously immunized children. The results seem to indicate that either 0.1, 0.5, or 1.0 ml. of fluid toxoid, or else 0.1, 0.5, or 1.0 ml. of alum-precipitated toxoid confers a satisfactory immunity in the majority of previously immunized children. It is also evident that, no matter which immunization procedure was used and no matter what level of antitoxin was achieved, there was always a gradual loss of antitoxin titer with time. In this respect, the results in the reimmunized children parallel the observations made in our study on primary immunization.<sup>2</sup>

In Table 6, the results from Table 5 showing the response to a single injection of fluid or alum-precipitated toxoid are combined to give a direct comparison between the two antigens. It can be seen that the response to a single injection of alum-precipitated toxoid is slightly better than that to fluid toxoid.

As shown in Table 7, there were 376 children who, at the time of reimmunization, had more than 0.001 unit of antitoxin. This group, as was to be expected, achieved a higher average level of antitoxin than the group of children with less than 0.001 unit of antitoxin. Here again the level of anti-

toxin achieved 4 months after reimmunization gradually fell with time.

Table 8 shows the comparison between a previously immunized and a non-immunized group of children after receiving 1 ml. of fluid toxoid or alum-precipitated toxoid. Both groups had less than 0.001 unit of antitoxin at the time of injection.

It is evident from the study of Table 8 that, although neither group has as much as 0.001 unit of antitoxin per ml. of circulating blood, the previously immunized group was much more responsive to a specific antigenic stimulus. This is in accord with the observations of Dudley, May, and O'Flynn<sup>1</sup> who found that, in subjects known at some time to have been Schick negative, when clinical infection developed, it was followed by a rapid and high increase in antitoxin—a response absent in those not known ever to have acquired Schick immunity.

Table 9 summarizes the response of all children reimmunized with a single injection of fluid or alum-precipitated toxoid. It is evident that, on reimmunization of a group of which 53 per cent had less than 0.001 unit of antitoxin, there is a high degree of response following injection of fluid or alum-precipitated toxoid. The injection of alum toxoid resulted in a slightly higher percentage of response than did fluid toxoid. The results also suggest the advisability of giving children entering school a single injection of fluid or alum-precipitated toxoid without first performing a Schick test.



[illegible]



TABLE 9

*Comparison of Antitoxic Response 4 Months After a Single Reimmunizing Injection of Either Fluid or Alum-Precipitated Toxoid (Including All Children Regardless of Antitoxin Titer at Time of Reimmunization)*

Immunizing Procedure	Total No. of Children	Antitoxin Titer		
		0.001 Unit or > per ml. Per cent	0.01 Unit or > per ml. Per cent	0.1 Unit or > per ml. Per cent
0.1 ml., 0.5 ml., or 1.0 ml. Fluid Toxoid	239	92	90	70
0.1 ml., 0.5 ml., or 1.0 ml. A.P. Toxoid	404	98	96	78

Table 10 compares the antitoxin response to reimmunization of children who received their primary immunization more than 4 years previously with those who were injected within 4 years. The results do not suggest any loss or gain in response within the time limits studied, regardless of whether or not the children had detectable antitoxin immunity remaining. The results with

those reimmunized within 4 years also confirms the feasibility of the reimmunization at school age of children originally injected in the first or second year of life.

Table 11 emphasizes the quickness of the response of children previously immunized. The comparative slowness in response of children not previously immunized is apparent.

TABLE 10

*Comparison of Antitoxic Response Between Children Reimmunized within 4 Years and Children Reimmunized More Than 4 Years After Primary Immunization, All Children Receiving a Single Injection of 0.5 ml. or 1.0 ml. of Alum-Precipitated Toxoid for Reimmunization*

Antitoxin Titer at Time of Reimmunization	Total Number of Children	Time Between Primary and Reimmunization	Antitoxin Titer 4 Mos. After Reimmunization		
			0.001 Unit or > per ml. Per cent	0.01 Unit or > per ml. Per cent	0.1 Unit or > per ml. Per cent
0.001 Unit or > per ml.	171	Less than 4 yrs.	98	98	95
		4 Yrs. or more	100	100	98
Less than 0.001 Unit per ml.	183	Less than 4 yrs.	95	91	66
		4 Yrs. or more	97	89	61

TABLE 11

*Comparison of Antitoxic Response at the End of 10 Days to a Single Injection of Fluid or Alum-Precipitated Toxoid*

History	Reimmunization	Antitoxin Level at Reimmunization	Total Number of Children	Antitoxin Titer 10 Days After Reimmunization			
				Less Than 0.001 Per cent	0.001 or More Per cent	0.01 or More Per cent	0.1 or More Per cent
No Previous Immunization	1 Inj. Fl. Toxoid	Less than 0.001	130	88	12	8	4
	1 Inj. A.P. Toxoid	Less than 0.001	87	76	24	17	16
Previously Immunized	1 Inj. Fl. Toxoid	Less than 0.001	5	0	100	100	80
	1 Inj. A.P. Toxoid	Less than 0.001	7	0	100	100	71
	1 Inj. Fl. Toxoid	0.001 or more	10	0	100	100	90
	1 Inj. A.P. Toxoid	0.001 or more	11	0	100	100	100

TABLE 12

*Comparison of Reactions Following Reimmunization with 0.1 ml. or 0.5 ml. of Fluid or Alum-Precipitated Toxoid*

Injection	Total Number in Group	Reactions			
		Mild Per cent	Moderate Per cent	Severe Per cent	General Per cent
0.1 ml. Fl. Toxoid	22	36	0	0	0
0.1 ml. A.P. Toxoid	57	58	2	0	..
0.5 ml. Fl. Toxoid	234	26	8	1	3
0.5 ml. A.P. Toxoid	240	37	14	7	3

Mild Reaction—Local tenderness detectable on pressure, small area of redness

Moderate Reaction—Local tenderness, slight pain on using arm, large area of redness

Severe Reaction—Arm so painful arm not used

General Reaction—Fever and malaise

It was believed very important to determine whether it is safe to reimmunize children. Fraser<sup>2</sup> has pointed out as a theoretical objection that the giving of doses of alum-precipitated toxoid at long and irregular intervals might possibly result in anaphylactic reactions. In this connection, it was observed that, in the entire group of 808 children, there were no general allergic reactions. It is important to remember that all possible sequences of fluid and alum-precipitated toxoid for primary immunizations and reimmunizations were used.

Table 12 shows that alum-precipitated toxoid produces a higher percentage of local reactions than fluid toxoid. However, as can be seen from this table, general reactions were infrequent following the use of either preparation.

#### SUMMARY

This study was undertaken to determine the reimmunization response of a group of children who had been immunized previously. It is apparent from observations made on 808 children, some of whom were followed for a period of 5 years after reimmunization:

1. That diphtheria antitoxin immunity, regardless of the immunizing procedure, is not permanent, and that, as time goes on, the antitoxin content of the blood is reduced. It is apparent that progressive reduction of antitoxin content, though slow, is very definite. This has been pointed out by other workers.<sup>3, 4</sup>

2. That reimmunization with fluid toxoid

or alum-precipitated toxoid is highly effective, and one small dose produces a response in a satisfactory proportion of children.

3. That no general allergic reactions were observed in the entire group, and the percentage of local reactions was not severe enough to discourage reimmunization.

4. That the previously immunized children who had lost all demonstrable antitoxin responded much better to a single injection than children not previously immunized and without demonstrable antitoxin.

5. That reimmunization of children 5 or 6 years after immunization in infancy would maintain the blood antitoxin at a good average level.

6. That alum-precipitated toxoid is somewhat superior to fluid toxoid as a reimmunizing agent, although its comparative effectiveness as an agent for primary immunization is much more striking.

Therefore, the procedure recommended by the Committee on Administrative Practice of the American Public Health Association, consisting of immunization in early childhood and reimmunization upon entering school, is practical. Widespread use of such a procedure should approach complete eradication of diphtheria.

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# Properties of Strains of *Corynebacterium diphtheriae* Obtained from Various Parts of the United States\*

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IN 1933, the writer and his collaborators, working in the Eastern Health District Laboratory at The Johns Hopkins School of Hygiene and Public Health, in coöperation with the Baltimore City Health Department, undertook a series of investigations of diphtheria carriers, for the purpose of comparing the carrier rate among Baltimore school children at that time with the rate obtained by Doull and Fales and their associates in the same city and, for the most part, in the same schools, in 1921-1924.<sup>1</sup>

At the time these studies were being organized, the prevalence of the newly described<sup>2</sup> *gravis* type of *Corynebacterium diphtheriae*, and its relation to severe and fatal diphtheria, as observed in England and Central Europe, were being discussed in all parts of the world. Little or nothing was known concerning the organism in the United States and, as a result, data were in demand regarding its distribution and epidemiological potentialities in this country. For this reason, in 1936, the Subcommittee on Diphtheria of the American Public Health Association, with the assistance of funds from the W. K. Kellogg Foundation, coöperated with

the Baltimore group, including the Department of Bacteriology of The Johns Hopkins School of Hygiene and Public Health, and the carrier studies originally planned on a local basis were broadened to include surveys of widely scattered portions of the country in several successive seasons. In addition, in 1940, arrangements were made, through the courtesy of the U. S. Public Health Service, to collect cultures of *C. diphtheriae* from persons ill with diphtheria in various cities from coast to coast.

## METHODS

A standard method of carrying on the surveys was agreed upon and all collaborating agencies worked to maintain uniformity of field procedures and laboratory technic. Bacteriologists in areas where cultures were isolated from carriers for the purposes of the surveys were given instruction in, and practical experience with, the standard bacteriological method either in the Eastern Health District Laboratory, The Department of Bacteriology, or in their own laboratories, by the writer acting for the committee as the Referee on Bacteriological Procedures.

An accurate and comprehensive study of the cultural properties and virulence of each strain of *Corynebacterium* isolated was made in the Eastern Health

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District Laboratories or the Department of Bacteriology of The Johns Hopkins School of Hygiene and Public Health, under rigidly controlled conditions. Details of these conditions and methods have been published elsewhere.<sup>2</sup> Determinations of virulence, cultural characters and type (gravis, mitis, etc.), therefore, were the same for all, and conformed as closely as possible to standard procedures and to original descriptions of type. Indeed, an important by-product of these efforts was complete realization of the importance of uniformity in laboratory technic. This was summarized in the statement that "if reports upon the occurrence of gravis and mitis and intermediate types of *C. diphtheriae* in different parts of the world are to be comparable, the criteria of identification must be equivalent. The designations are not valid unless the strains under consideration have been shown to conform fairly closely to the criteria originally set up by Anderson, *et al.*, as characteristic. . . . Failure of many investigators to describe in detail the full complement of the biochemical characters of their 'gravis,' 'mitis,' and intermediate types, or the methods by which they were determined, or both, renders almost fruitless much of the work in the field."<sup>3</sup>

#### RESULTS

Some of the bacteriological results of the carrier and culture studies have already been published,<sup>4, 5, 13</sup> but these earlier papers, although complete at time of publication, lacked important data which were obtained subsequently and which are briefly summarized in this final communication. The summary of all the work may be given under four heads, as follows:

1. *Culture collection*—Over the period of about 8 years during which these investigations were pursued, and with the collaboration of many persons,

including physicians of the Eastern Health District and staff members and students in the Departments of Bacteriology and Epidemiology of this school, personnel of various state and city health departments, officers of the U. S. Public Health Service, and several bacteriologists in England, there has accumulated in Baltimore a unique collection of over 2,000 strains of corynebacteria, all thoroughly documented as to biological properties and catalogued as to source.

The bacteria are maintained desiccated *in vacuo* and are, in most instances, the same identical individuals which were first isolated in pure culture, being separated from the throat of the patient or carrier only by the following steps:

1. Original cultivation on Loeffler slant directly from nose or throat
2. The above growth streaked on a plate of cystine-tellurite agar
3. Colony fished from the plate to a slant of Pai or Loeffler medium
4. The latter growth, suspended in serum or blood, preserved in vacuum desiccation jars

No culture, so preserved, has so far failed to grow readily on removal from the vacuum jars to blood-dextrose infusion broth. The practical value of this collection of cultures has already been realized by its use as a source of material for several investigations in this laboratory, as a source of type cultures for various investigators in various parts of both hemispheres, and as a source of data referred to in the following paragraphs.

2. *Technological improvements and biological data*—As the work progressed, many technical data of use in the public health laboratory were accumulated and some of the information gained has been valuable in improving methods for the isolation of *C. diphtheriae*, especially from carriers. An example is the formula for the cystine-tellurite agar mentioned above.<sup>6, 7</sup> The formula was

found to yield a very high percentage (98 or 99 per cent) of isolations of diphtheria bacilli from morphologically positive throat and nose cultures from cases and case-contact carriers, and to detect the diphtheria bacillus and to permit its isolation from many casual, non-case-contact carrier cultures yielding negative whole-culture virulence tests or negative microscopic diagnoses, or both. Its special value in field studies was reported by Frobisher and Van Volkenburgh in 1935.<sup>8</sup>

Pai's egg medium<sup>9</sup> which had been used to some extent in China as a substitute for Loeffler's medium was thoroughly tested, in a somewhat simplified form, during these studies. The modified "Pai's egg medium, containing no serum, was found to give as reliable results as Loeffler's medium with respect to both morphology and virulence, and to be much simpler to prepare; an important consideration to laboratories so situated that the preparation of complicated medium is impracticable or where the obtaining and storing of serum is a matter of expense or difficulty. Many small laboratories engaged in public health bacteriology encounter such difficulties."<sup>6</sup> Subsequent statistical studies<sup>10</sup> suggested that the egg medium may sometimes fail to yield expected numbers of *avirulent* strains of *C. diphtheriae* when used for initial cultures from the nose and throat, although there is no difficulty in the isolation of *virulent* strains. This matter deserves further investigation.

A considerable study of the physiological properties of *C. diphtheriae* was also made "with the hope of discovering some . . . property which might be of use in distinguishing between different groups of strains within the species limitations of *C. diphtheriae*. About 150 virulent and avirulent cultures from carriers, cases, and case contacts, including *gravis*, *mitis* and intermediate strains, were subjected to tests for their

power to hydrolyze a variety of substances including carbohydrates, proteins, glucosides, organic acids, etc., as well as for a number of other properties. . . . While our knowledge concerning a variety of biochemical properties of *C. diphtheriae* was increased by the work performed, no correlations which might be of use in establishing groups within the species of *C. diphtheriae* were brought to light."<sup>11</sup>

3. *Results of carrier surveys, determination of gravis and mitis types, etc.*—The case and carrier studies carried out after 1936, in the country as a whole, yielded data which have proved of interest because, in addition to complementing, in this hemisphere, many surveys made in England, Europe, and other parts of the world, they are the first large-scale data on this subject obtained in the United States. In the interest of brevity, the principal findings may be grouped under three subheadings as follows:

a. *Geographical distribution of certain types of diphtheria bacilli*—Several facts concerning the geographical distribution of diphtheria bacilli were cited in earlier studies, and additional pertinent data collected in the last year are given in this report. Marked differences in types prevalent in certain regions are exemplified by the results of surveys carried on in Alabama and New York State. In 1938–1939, 45 per cent of 104 cultures from Alabama were *gravis* or *gravis-like*, and 28 per cent of these were virulent (Table 1, Line B). Contrasting with this was the situation in Kingston, N. Y., where no virulent cultures and no *gravis* or *gravis-like* strains were found among nearly 1,800 children during the same season. Instead, 23 strains of the *mitis* type were isolated. None was virulent (Table 1, Line F). Data showing similar differences between groups of cultures were obtained in several other areas (*e.g.*, Saginaw, Mich., and Richmond, Va.,



TABLE 1

Year (1)	Season (2)	Area of Survey (3)	Children Examined (4)	Strains Isolated (5)	Gravely and Gravely-like (6)		Mitis and Mitis-like (7)		Virulent (8)		Avirulent (9)		
					No.	%	No.	%	No.	%	No.	%	
A	1937-38	Oct. '37-Feb. '38	Alabama (Lee, Chilton and Marshall Cos. and Birming- ham City)	3,499	00	9	10	59	66	18	20	72	80
B	1938-39	Oct. '38-Dec. '38	Alabama (Randolph and Shelby Cos.)	1,800	101	47	45	37	36	29	28	75	72
C			Randolph County	900	43	7	10	29	67	19	..	..	..
D			Shelby County	900	61	44	72	8	13	10	..	..	..
E	1939-40	Spring	Alabama (Pike Co.)	950	49	0	..	45	92	2	4	47	96
F	1938	Oct. '38-Dec. '38	New York (Kingston)	1,798	23	0	..	23	100	0	..	23	100
G	1940	Jan. 8-Mar. 5	New York City (Lower East Side)	2,360	77	8	10	54	70	14	18	63	82
H	1940	Dec. 4-Dec. 18	New York City (Lower East Side)	498	33	0	..	33	100	0	18	27	82
I	1937-38	Oct. 18, '37- Feb. 28, '38	Virginia (Hanover, Prince George, Potomac Cos.; Norfolk,	1,980	34	0	..	32	94	10	29	24	71
J	1938-39	Oct. 18, '38- Apr. 4, '39	Virginia (Arlington, Pitt- sylvania, Fairfax Cos.; Rich- mond City)	1,793	17	11	65	2	12	3	18	14	82
K	1933-37	Oct. '33-June '37	Baltimore (E.H.D.)	7,721†	237‡	12	5	178	75	..	..	..	..
K¹	1936-37	Dec. 11-Feb. 12	Baltimore (E.H.D.)	1,007	12	1	8	11*	92	11	92	1	8
L	1939	Oct. 16-Nov. 20	Baltimore (E.H.D.)	1,102	17	0	..	15	88	5	31	12	69
M	1937-38	Oct. '37-May '38	{ Cleveland City Schools	31	0	0	..	31	100	7	23	24	77
N	1938-39	Nov. '38-May '39		26	1	1	4	32	85	0	35	17	65

\* Not determined for all strains isolated. This figure is therefore an approximation only.

† Exclusive of about 200 cases or contacts.

‡ Includes about 140 case and contact cultures.

Ossining, N. Y., and Kingston, N. Y.), and have already been reported.<sup>13</sup>

Considering the Kingston and Alabama data in the light of recent downward trends in diphtheria carrier and morbidity rates, especially in the North, the question naturally arose as to whether these findings represented a situation in which cultures from northern latitudes were largely of the avirulent and mitis types while those in the South, in general, were more commonly virulent and of the gravis type. It was found on further investigation that this was probably not the case, and that marked differences of this sort can exist in contiguous areas in the South as well as in widely separated zones North or South. For example, a slightly more detailed study of the 1938-1939 Alabama data revealed an interesting difference between two nearby counties. In Randolph County 67 per cent of 43 carrier cultures were mitis or mitis-like in character and 16 per cent were gravis and gravis-like.\* The virulent carrier rate was 2.1. In Shelby County, at the same time, of 61 cultures isolated, only 13 per cent were mitis-like, and 72 per cent were gravis or gravis-like.\* The virulent carrier rate was 1.0 (Table 1, Lines C and D).

More recent findings show that gravis strains are not necessarily characteristic of Alabama diphtheria carriers, nor mitis strains of the northern children. Shelby County seems to have been an exception. For example, in Alabama, in 1939-1940 in Pike County, 92 per cent of the carrier cultures were mitis-like and none was gravis-like (Table 1, Line E). Investigating a more northerly area, it was found that, of 77 cultures obtained in the Lower East Side of Manhattan, New York City, in the same fall and winter, 10 per cent were gravis-like and 70 per cent were mitis-like (Table 1, Line G).

These facts and similar data obtained in other areas (Cleveland, Ohio, and Baltimore, Md.), all together indicate that: (a) appreciable differences in prevalence of various kinds of diphtheria bacilli may exist concurrently in populations within a few miles of each other; while (b) similarities may exist in culture types found over wide areas; and (c) latitude may have little or nothing to do with the diphtheria flora. More extensive data are obviously needed on the ecology of the corynebacteria.

b. *Differences in prevalence of different types of diphtheria bacilli in successive seasons*—The impression was gained from the results of certain successive surveys that the flora characteristic of a population group in one season may differ considerably in a later season. In some places there was little change from year to year. Unfortunately, however, surveys made in the same area in corresponding seasons of successive years, by the same technic and persons, are exceedingly rare so that no final conclusions may be drawn concerning this matter. While the data available are of great value as bases of comparison for future surveys, they serve best at present to emphasize the desirability of further investigation in the same areas and during comparable seasons.

In Baltimore, for example, the same schools in the Eastern Health District and contiguous zones were examined in several successive years, but not always in corresponding seasons or by the same methods.<sup>10</sup> However, here the flora seemed fairly stable. Thus, in the years 1933-1937, 5.5 per cent of 237 cultures from cases and carriers were gravis or gravis-like. Only one or two gravis-like cultures were found in any one year. Seventy-five per cent were mitis or mitis-like.\* No gravis-like strains were found among 17 cultures isolated in 1939, but 88.2 per cent were mitis-like,

\* The remaining cultures were indeterminate in character.

the remainder indeterminate (Table 1, Lines K and L).

On the other hand, of 90 cultures obtained from carriers in Alabama in the fall and winter of 1937-1938, 59 (66 per cent) were mitis and mitis-like and 9 (10 per cent) gravis or gravis-like. The proportions differed somewhat in the winter of 1938-1939, while in the spring of 1939-1940, of 49 carrier cultures, 92 per cent were mitis or mitis-like and none was gravis-like.\* The former figures are based on Lee, Chilton, and Marshall Counties, the latter on Pike County (Table 1, Lines A, B and E). In Virginia, of 34 cultures obtained from carriers during 1937-1938, none was gravis-like and 32 (94 per cent) were mitis or mitis-like.\* In 1938-1939, of 17 cultures isolated during carrier surveys, 11 (65 per cent) were gravis or gravis-like and 2 (12 per cent) were mitis-like\* (Table 1, Lines I and J). Here again, the areas studies in successive seasons were different. In the Lower East Side of Manhattan, New York City, during the early months of 1940, 8 (10 per cent) of 77 carrier cultures were of the gravis or gravis-like type, while 54 (70 per cent) were mitis or mitis-like. In the following December, 33 strains were isolated from 498 children, and all of them were mitis or mitis-like (Table 1, Lines G and H).

Differences in the ratio of avirulent to virulent strains or in the virulent carrier rate, or both, were observed in the data collected from year to year in some sections, but not in others. But here again, most of the differences reported are representative only of large general areas, and entire fall-winter-spring survey periods, because not exactly the same populations were examined in each season, and the surveys were not always carried on during exactly the same weeks or months of

each year. The season-area data pertinent to these surveys are shown in Table 1. In Alabama, 18 of 90 cultures (20 per cent) isolated in 1937-1938 were virulent, and 29 of 104 cultures (28 per cent) were virulent in 1938-1939. Contrasting with these figures are those for the season 1939-1940, in which only 2 of 49 cultures (4 per cent) were virulent (Table 1, Lines A, B, and C, Columns 8 and 9). The same counties were not examined each season, but all were near Montgomery. The situation was different in Baltimore where, in 1939, 5 virulent cultures (31 per cent) occurred among 17 strains isolated from 1,102 children (Table 1, Line L). In the same areas, in surveys carried on during 1934-1936, 35 virulent cultures (34 per cent) had appeared among 104 isolated from 3,228 children. Similar to this situation was that in the Lower East Side of Manhattan. Here, during early 1940, of 77 cultures taken from 2,360 children, 14 (18 per cent) were virulent and, in the latter part of 1940, 6 (18 per cent) of 33 cultures obtained from 498 children were virulent (Table 1, Lines G and H, Columns 8 and 9).

Three impressions emerge with some degree of clarity from this rather confusing collection of data. First, bacteriological findings in one season are of no value in predicting the bacteriological situation in a subsequent season anywhere. Second, with respect to the seasons and areas investigated, the ratio of virulent to avirulent strains in the various population groups studied is generally static or downward.† Third, with one or two exceptions, the mitis-like types of *C. diphtheriae* seem to be generally in the majority and may be increasing in prevalence.

c. *The gravis type of C. diphtheriae in persons with clinical diphtheria, their immediate contacts, and casual carriers*

\* The remaining cultures were indeterminate in character.

† This does not necessarily apply to carrier rates, although it does in some areas.

TABLE 2

*Types of C. diphtheriae in Clinical Cases and Household Contacts, and in Casual Carriers, in Various Parts of the United States, 1939-1941*

Source	Cultures	Mitis-like		Gravis-like		Indeterminate types	
		No.	%	No.	%	No.	%
<i>Cases and contacts</i>							
Colorado	6	6	100	0	..	0	..
Indiana	33	26	79	1	3	6	..
Kentucky	1	1	100	0	..	0	..
Maryland	26	18	69	4	15	4	..
Minnesota	16	8	50	1	6	7	..
Mississippi	4	2	50	2	50	0	..
Missouri	26	22	85	1	4	3	..
New Mexico	7	7	100	0	..	0	..
North Carolina	2	0	..	0	..	2	..
Utah	4	4	100	0	..	0	..
Virginia	33	24	73	6	18	3	..
Ohio	4	4	100	0	..	0	..
Wyoming	16	12	100	0	..	0	..
Total	178	138	77.5	15	8.4	25	14.1
<i>Carriers</i>							
Alabama	49	45	92	3	6	1	..
Baltimore	21	13	62	2	10	6	..
New York City	109	87	80	8	15	14	..
Utah	2	2	100	0	..	0	..
Total	181	147	81.2	13	7.1	21	11.6
<i>Source not stated</i>							
California	88	71	78	10	12	7	..
Ohio	5	5	100	0	..	0	..
Total	93	76	83.6	10	11	7	7.5
Grand total	452	361	80.2	38	8.4	53	11.7

in the United States—One of the major objects of this study was to obtain accurate information concerning the frequency of occurrence of the gravis and other types of *C. diphtheriae* in persons with clinical diphtheria and their immediate contacts, as well as in healthy casual carriers, in the United States as a whole. With the coöperation of many interested workers, 178 cultures of *C. diphtheriae* were obtained from clinical cases of diphtheria and from their familial or immediate contacts, during the season 1939-1941 from the places shown in Table 2. In this group of cultures, as is shown in the table, the mitis and mitis-like types were about 9 times as common as the gravis and gravis-like types. Two hundred and seventy-four other cultures were collected from carriers and miscellaneous sources during the same period from various

other places in the country. In this group also the mitis and mitis-like types were greatly in the majority (10:1). All were newly isolated by various bacteriologists. In the whole collection of 452 case, carrier, and contact cultures obtained from all areas in 1939-1941, there were about 9.5 times as many mitis and mitis-like as gravis and gravis-like cultures. This is in general agreement with previous experience in Baltimore where the mitis-like strains greatly predominated, and where there was relatively little change in the situation over a period of years. It is also in agreement with recent findings in New York City where Seligmann has found the mitis, undeterminate and avirulent strains to be greatly in the majority.<sup>17</sup>

In the country as a whole, therefore, it seems that, except for small, local, and probably temporary concentrations

of the gravis type, such as have occurred in Alabama and Virginia, and in one small, explosive outbreak in Belair, Md., in 1936, the chance of finding a gravis or gravis-like strain of *C. diphtheriae*, as measured by the surveys of 1933-1941, has been at most not more than 1 in 9. The chance of finding a *virulent* gravis or gravis-like strain in carriers has been even smaller than this; probably no more than about 1 in 40 considering the country as a whole since, of about 180 gravis and gravis-like strains isolated since 1933 in *all* surveys, only about 45 (25 per cent) were virulent. Since these figures include gravis-like as well as *true* gravis\* strains, the possibility of finding the latter is still less than 1 in 40, and is more likely to be 1 in 100 or more in most areas.

These observations indicate that, during the period of the surveys, in the areas covered by them, the gravis type of *C. diphtheriae* has been of little clinical significance and is not, at the time of writing this report (June, 1941) a constant or pressing problem to health officers or physicians in general in the United States. It must not be forgotten, however, that some strains of *C. diphtheriae* may be "susceptible, at times, of a tremendous exaltation of virulence, aggressiveness or dispersiveness. The enhancement of virulence (for human beings) does not seem to be manifested in the usual animal tests and may not always be accompanied by gravis cultural characters, but it seems to be found frequently in strains possessing these characters. This enhancement of virulence seems to convert them into extraordinarily dangerous parasites not (greatly) hampered by immunity as we

ordinarily measure it (in human beings). Such strains were involved in the Leeds outbreak and form the basis of the original description of the gravis type of diphtheria bacillus. Therefore, *if* gravis strains are most susceptible of sudden great enhancements of virulence, their increasing prevalence in any community may constitute a potential menace."<sup>5</sup> A possible example of such a development may be seen in the explosive outbreaks reported in Halifax and Portsmouth, Nova Scotia, in 1940-1941. Strains kindly forwarded to the author by Dr. J. H. Mueller and Dr. E. B. Schoenbach of Harvard University have been of the gravis type.

Perhaps the United States typifies the areas "with mild epidemics and low morbidity" referred to by Seligmann: "In countries with widespread epidemics and severe outbreaks the existence of sharply differentiated types of diphtheria bacilli, often clinically in agreement with the nomenclature of the British authors, is readily confirmed. In countries with mild epidemics and low morbidity, difficulties in differentiating types are often encountered and, if types are found, they do not seem to be of any clinical significance. In such areas one observes many avirulent and atypical strains that cannot be classified as belonging to any one of the described types."<sup>12</sup> The latter two sentences would describe the present situation in the United States.

d. *Establishment of base-line data for future comparison*—In closing this portion of our summary, it is realized that objections may justly be raised against any definite or final conclusions of a comparative nature drawn from the present survey results because of lack of uniformity with respect to season and population groups in each area. It cannot be gainsaid, however, that these surveys provide, as indeed they were intended to do, bases for future comparative studies which are exceptionally

\* *True* gravis strains are characterized by the usual properties of *C. diphtheriae* and by: fermentation of starch and glycogen; formation of large "scalloped" and irregular colonies on chocolate-tellurite agar; formation of pellicle and early alkalinity in broth; failure to produce soluble hemolysin in broth. *Gravis-like* strains may lack one or two of these properties. *Mitis* strains are generally negative or opposite in all respects.

useful because of the unusual degree of uniformity of technic, completeness of record, and other important details which have obtained throughout the whole coöperative effort.

One complaint common to nearly all of the reports of the collaborating members of the Subcommittee on Diphtheria published from time to time, and especially in the Supplement to the March (1940) issue of the AMERICAN JOURNAL OF PUBLIC HEALTH,<sup>13</sup> has been to the effect that: "Unfortunately no data are available from previous studies of this nature for comparison with the present survey results." or "It is not known what the situation has been in previous years so that no idea of trend can be formed at present." These statements will not be necessary in the future and the committee may well feel gratified that this is so.

4. *Studies of avirulent strains*—It is the experience of most investigators that incidental observations made during the activity of a major research project have sometimes proved to be of no little interest in themselves. So, during the present group of surveys, collateral studies, especially of virulence of corynebacteria, have yielded data which seem to have considerable theoretical and practical value *per se*.

Investigations of virulence of different types of *C. diphtheriae* begun in the summer of 1940 led to the discovery that not only virulent but also the so-called avirulent strains of *C. diphtheriae*\* are highly lethal when injected intracerebrally into mice. This was reported briefly in 1940, and problems arising from it are still under active investigation.<sup>14</sup>

A point of interest in this connection, long under discussion by epidemiologists, concerns the possible rôle of these so-

called avirulent strains in the maintenance of at least a part of the natural ("silent") immunity (as judged by the Schick test) found in children under 10 years of age. In some areas as many as 92 per cent of the children are naturally immune. Virulent carrier rates do not always seem adequate to the maintenance of such widely distributed natural immunity. Data have been obtained in preliminary investigations made in this laboratory, and already reported in abstract,<sup>15</sup> indicating that immunization with these organisms may give some protection against virulent strains, but the results are as yet merely suggestive. Detailed information may be published later.

Additional studies of virulence have revealed the fact that 7 to 14 day old chicks (unless protected with antitoxin) are highly susceptible to diphtheria toxin and to virulent cultures, and *not at all* to avirulent strains or diphtheroids, and so may serve as substitutes for guinea pigs and rabbits in routine virulence tests, or in estimations of the potency of toxins, antitoxins, etc., with the advantage that they are readily obtainable at all times from hatcheries or the laboratory incubator at a cost of 8 to 15 cents apiece.<sup>16</sup>

#### SUMMARY

1. A study of strains of *C. diphtheriae* isolated from healthy, casual carriers, persons with clinical diphtheria, and the familial or other immediate contacts of the latter, has been conducted in collaboration with national, state, and local health agencies in the United States. A large collection of pure cultures (about 2,000) representing 17 states from New York to California and Minnesota to Mississippi, has been carefully studied and described and is maintained desiccated *in vacuo* in the material in which originally isolated.

2. Investigations carried on in the laboratory concurrently with the field studies have led to several improvements in methods for isolation of *C. diphtheriae* from the throat, especially of carriers.

3. Carrier surveys have shown that any

\* Organisms indistinguishable from ordinary *C. diphtheriae* except that they cannot be shown to be toxigenic by means of rabbit and guinea pig tests.

type of diphtheria bacillus, e.g., *gravis* or *mitis*, virulent or avirulent, may predominate and at times may be the only type present in some communities but not in others. It was found that this phenomenon may be extremely localized or very general, and that, under present conditions in the United States, conclusions in regard to type prevalence or rates are not valid beyond the confines of a county or state, and often a town or village.

4. The data suggest that changes may occur from year to year in any given area in the prevalence of *gravis*, *mitis*, and other types of diphtheria bacilli, and in the ratio of virulent to avirulent and *mitis* to *gravis* strains as well as in the absolute numbers of either. However, further information is needed concerning these problems before generalizations can be made. In the meantime, descriptions of diphtheria carrier rates, types, virulence, etc., should state accurately the time as well as the area covered, in addition to the methods used in obtaining the data.

5. Many of the strains of the *gravis* type of *C. diphtheriae* encountered in carriers in the United States during these studies are wholly avirulent when tested by the usual methods.

6. In a group of over 175 cultures obtained from clinical cases of diphtheria, and their household contacts, between November, 1939, and March, 1941, in various parts of the United States, there were about 10 times as many *mitis* and *mitis*-like strains as *gravis* and *gravis*-like. About the same ratio was found among 181 carrier cultures obtained in 1939-1941 from Alabama, Baltimore, New York City, and Utah (11:1). Among 452 cultures obtained from all sources in 1939-1941, 361 were *mitis* or *mitis*-like, and 38 were *gravis* and *gravis*-like (a ratio of about 9.5:1).<sup>\*</sup> The *mitis*-like type of *C. diphtheriae*, therefore, is at the time of writing (June, 1941), about 10 times as common as the *gravis*-like type in the United States. Since only about 1 in 10 of the latter is of the true *gravis* type, and virulent at the same time, probably not more than about one strain of *C. diphtheriae* in over 100 in the United States is of the virulent and genuinely *gravis* type except in a certain few, sharply localized areas where outbreaks have occurred.

7. The *gravis* type of *C. diphtheriae* is not an important health problem in the United States at present, but may become so at any time.

8. The data presented or referred to herein constitute a sound basis for future investiga-

tions on the epidemiology and bacteriology of diphtheria in the United States.

9. Studies of the virulence of organisms of the genus *Corynebacterium* showed that (a) 7 to 14 day old chicks are, in many respects, more desirable subjects for testing the virulence or toxigenicity of diphtheria bacilli, and for measuring the potency of toxin, than are guinea pigs and rabbits, and are an entirely practical substitute for these purposes, within certain limits; (b) although mice are highly resistant to virulent cultures of *C. diphtheriae* and to diphtheria toxin injected intraperitoneally or subcutaneously, they are highly susceptible to these materials injected intracerebrally; (c) not only are they susceptible to virulent cultures and to toxin, but they succumb with almost equal regularity, and exhibit exactly the same highly characteristic symptomatology when similarly injected with cultures of *C. diphtheriae* which are avirulent as determined by the rabbit, guinea pig, and chick tests.

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# Public Health Activities of the American Red Cross

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THE questions we have been asked in the months since our association with the American Red Cross have led us to the conclusion that for an organization that has functioned as long and that has been as prominently in the public view as the American Red Cross, there is a surprising lack of sound knowledge as to what its objectives are and how it operates.

It is, therefore, the purpose of this paper to review, define, and to reemphasize the responsibility and function of the Red Cross as a public health adjunct.

Since its organization the Red Cross has included medical and health services and public health work among its major activities. The very connotation of the words "Red Cross" brings up the idea of services of health and welfare.

Most of us can agree that the protection of the public health is a function of government. Likewise we can agree that voluntary health agencies should continue to exert their efforts toward supplementing and supporting the work of these official agencies. In this understanding of function and relationships the Red Cross makes a significant contribution to the national welfare by its educational and service efforts in the field of public health.

Being semi-official, non-political, and

non-partisan, with an emblem known everywhere, a prestige gained from accomplishment in doing the job and 3,743 local Chapters in the United States, the Red Cross will continue to make these contributions, in peace and in war, to improve the public health and welfare.

The activities of the Red Cross in foreign service, in disaster relief, and in public health nursing are well known. Its instruction courses in First Aid, Water Safety, Accident Prevention, Home Nursing, and Nutrition have furnished leadership which has improved and extended what the official agencies have today. Broadly speaking, all services of the Red Cross have health and welfare significance, but the activities of some are so pertinent to our present defense and war efforts that some detail is indicated.

## DISASTER RELIEF

For purposes of definition, a disaster is a situation, usually catastrophic in character, in which numbers of people are suddenly plunged into helplessness and suffering.

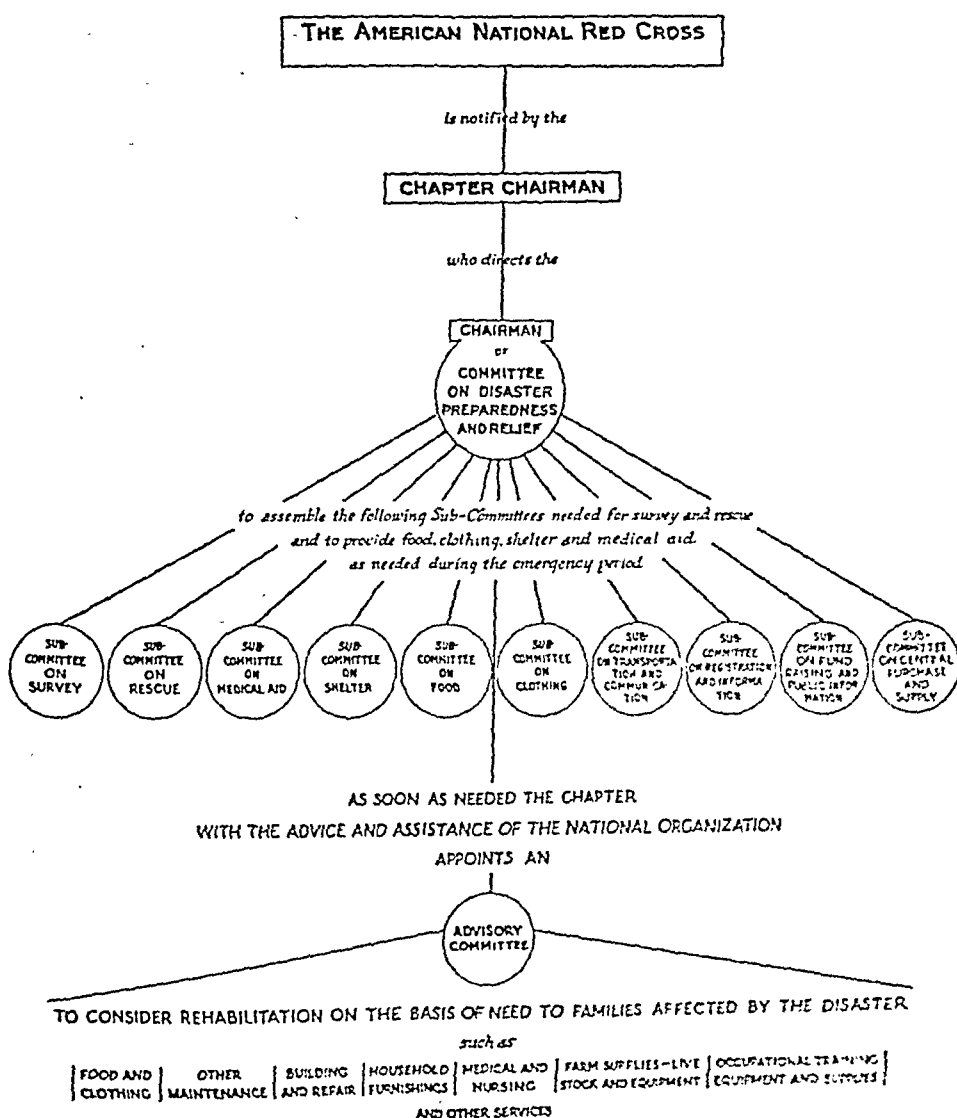
The immediate objective behind disaster aid is that of meeting emergency needs, be they medical and surgical—or food, shelter, clothing, and the replacement of household goods and property. The ultimate objective is to assist

the victims of such catastrophies in taking up life where they left off when the disaster struck. The Red Cross does not replace all losses caused by disasters—since some of these losses occur among those who are self sustaining through reserve funds, insurance, or through available community facilities. It does attempt to meet immediate needs and rehabilitate those who, because of the disaster, would be destitute. With this program it supplements, does not duplicate, the public and private resources of the community.

The Disaster Relief Service operates through its national staff and through the facilities of its local Chapters, utilizing their welfare, health, and other services. In this service the Red Cross clearly defines its relationship to existing medical and public health agencies.

The American Red Cross recognizes that the primary responsibility for the care of the sick and injured in disasters rests with the local physicians. Red Cross medical service in Disaster Relief does not substitute for the services of local physicians and dentists, but coop-

## When Disaster Strikes\*



erates with them by assisting in the organization and direction of the medical and relief work and by providing the facilities which they may lack. Every effort is made to maintain and reestablish as quickly as possible the predisaster relationships between physicians or dentists and their patients. If emergency hospitals are needed in the first few days, these are closed as soon as practicable and the patients returned to their physicians.

We believe that this broad program of relief and welfare is an endeavor representing the Red Cross at its peacetime best. With a background of experience and a national organization used to supplementing local aid when disaster strikes, the Red Cross is in a position to operate and cooperate effectively in disasters caused by disease, flood, tornado, earthquake, and belligerent enemy action.

#### RELATIONSHIPS WITH OFFICE OF CIVILIAN DEFENSE

Any review of the activities of the Red Cross Disaster Service naturally suggests the functional relationships between the Red Cross and the Office of Civilian Defense. In the agreement between the Chairman of the American Red Cross and the Director of the U. S. Office of Civilian Defense, the Red Cross has agreed to make available all of its facilities in time of emergency caused by enemy action. Recognizing the basic responsibility of government, it is the duty of every Red Cross Chapter and Branch to aid in the most efficient marshalling of the resources of the community. It is further agreed that duplication should be avoided, and that the training courses required in civilian defense and the long established nation-wide facilities of the Red Cross should be utilized to the fullest extent.

Services required in civilian defense activities should be made available by Chapters to local Defense Councils.

Chapters should cooperate to the fullest extent and, during the period of emergency, should operate subject to the authority of the Defense Councils or appropriate governmental officials. Red Cross at all times will maintain administrative and financial control of its immediate operations.

In the comprehensive planning required for emergencies caused by enemy action, it is inevitable that confusion will arise as to function and responsibility. As we have viewed this problem on the national level and have heard reports from local areas, two factors it seems are responsible for this confusion.

1. The unwillingness of some individuals in local Chapters of the Red Cross to realize the need of integration of all services in time of disaster under one responsible authority.

2. The desire of certain Office of Civilian Defense representatives to take over and supervise all functions of all voluntary agencies before and during the emergency.

Much of this confusion, we believe, could be avoided if all local Red Cross Chapters would realize the need of coordination of activity and central control at the time of disaster, and if all Civilian Defense organizers would realize that the Red Cross Chapters have their regular programs to carry on before emergency strikes and are not subject in preemergency periods to the authority of civilian defense.

#### SERVICES TO THE ARMED FORCES

It is erroneously assumed by some that the Red Cross is primarily responsible for the health of soldiers and sailors and the wounded in time of war. This is not the function of the Red Cross, but is the function of the Medical Departments of the Army and Navy. Without attempting to outline the numerous specialized activities which are involved, the scope of the Red Cross services to the armed forces may be broadly described as follows: The Red Cross conducts social service

and recreation activities for the benefit of members of the armed forces in Army and Navy hospitals wherever they may be. This includes medical and psychiatric social service in the general hospitals of the Army and Navy for the large number of patients who require this specialized assistance. The program on behalf of the hospitalized service men is particularly designed to aid service men during the convalescent period before they are able to return to duty, a period when morale is likely to be lowest. This service also provides for cases arising among service men which may involve communication with, and sometimes aid to, their families for the solution of special difficulties.

#### FIRST AID

First Aid as taught by the American Red Cross stresses the immediate emergency care given the victims of an accident in the absence of a physician. A good instructor will emphasize the negative aspects—what not to do—as well as the positive. Much confusion as to procedures outlined in the course would be avoided if it were constantly kept in mind that First Aid Instruction is designed primarily for the layman in giving emergency care before the arrival of a physician.

From June, 1910, to December, 1941, the Red Cross First Aid division issued three million certificates for completion of its Standard Course. Since entry of the United States into World War II the Red Cross has issued over five million textbooks. Certificates for the completed course are now averaging over 300,000 each month—or four million a year.

#### NURSING SERVICE

The Nursing Service of the American Red Cross is charged by act of Congress with the responsibility for maintaining a reserve of nurses adequate at

all times to meet the needs of the armed forces. The Army and Navy expect to supplement their Nurse Corps from this reserve, all members of which have been certified by the American Red Cross as meeting the requirements of the Army and Navy Nurse Corps. This procedure relieves the Army and Navy of the preliminary investigation of all applicants and enables them to concentrate on the problems of assignment. A Red Cross nurse, once she is assigned by the Army or Navy, becomes a member of the Army and Navy Corps and is entitled to all benefits accruing to Army and Navy personnel.

This enrollment of Red Cross nurses becomes vitally important when the United States is at war. During the past twelve months 13,166 nurses were added to the Red Cross First Reserve roster. In addition there are now 60 American Red Cross nurses on duty in England, working as a part of the Red Cross-Harvard communicable disease unit, and a unit of 75 nurses, half of whom are now on duty, to supplement nursing service to the civil population in Hawaii.

In meeting disasters which occur in normal times and not as a result of total war, Red Cross Nursing Service plays an active part. There were only 22 days during the last fiscal year in which no nurse was engaged in disaster nursing, and at present the Red Cross maintains on call throughout the country a small reserve of nurses experienced in disaster nursing.

There are still many sections of the country where the official health agencies have not developed a nursing program. It is in these areas that the Red Cross Chapters are carrying on public health nursing. It is recognized as fundamental that the Red Cross Nursing Service pioneers and supplements—does not supplant—state and local nursing programs.

In the promotion of positive health,

it is recognized that the people themselves should assume some responsibility for maintaining their own health standards by awareness of symptoms which indicate ill health. To meet this need courses in Red Cross Home Nursing are offered. These are taught by professional nurses, and consist of at least 24 hours of practical instruction in how to keep the family well. The objective is to provide simple nursing care in the home to members of the family who do not need continuous hospital and nursing care. Last year 80,000 certificates were granted; this year it is estimated that more than a half million people will complete the course.

In view of the present demand for an adequate supply of nurses, and recognizing that the most important objective is to increase in every way the normal supply of graduate nurses, it yet seems clear that nurses' aides and assistants of several different kinds are needed to care for the sick and to prevent illness in our country in this time of war. It was, therefore, decided in July, 1941, that the Volunteer Special Services of the Red Cross and the Red Cross Nursing Service should collaborate in the development of a nationwide program for the training of Volunteer Nurses' Aides. In 45 states and the District of Columbia. 449 Chapters are carrying on such programs, and the American Red Cross has been designated by the Office of Civilian Defense as the sole training agency for these volunteer nursing aides.

#### NUTRITION

The Red Cross nutrition program today has a vital double significance in the total war effort of the nation. It helps build civilian power behind military power by providing men and women throughout the country with the knowledge of food needs and food values upon which stamina, working efficiency, and morale depend. It is

primarily a long-range, continuing program of education directed to all income groups.

The Red Cross nutrition program is also an emergency program, training groups of lay volunteers in the preparation and serving of food in large quantities under emergency conditions in readiness for situations that might arise from disasters or enemy action.

#### JUNIOR RED CROSS

The American Junior Red Cross is a division of the membership of the American National Red Cross. Its 1942 estimated enrollment of 14 million is restricted to school pupils, including children in public, private, and parochial schools.

The purpose of the Junior Red Cross is to promote positive health, to provide opportunities for the participation of youth in worth while service activities, to give practice in responsible citizenship, and to assist in promoting international understanding.

This reserve of youth presents a dynamic potential and design for healthy living.

#### VOLUNTEER SPECIAL SERVICES

The purpose of Volunteer Special Services is to maintain in every Chapter regular services to the community, such as Production, Canteen, and Motor Corps. This provides a group of volunteer workers trained by year-round activity for prompt and efficient service in emergencies, those peacetime emergencies such as floods, fires, tornadoes, and the greater emergency of war. For example, last spring the Red Cross was requested to produce for the Army a reserve of 40 million surgical dressings and the Production Service is approaching the completion of this very practical task.

#### MEDICAL AND HEALTH SERVICE

In 1940 and 1941 the following new

projects were undertaken as a part of Red Cross participation in the national emergency program.

*Enrollment of Medical Technologists*—As of April 30, 1942, 25,196 inquiries had been made by medical technologists, 7,452 applications had been received, and there was a total net enrollment of 3,853. A sensitive index of the increased activity of the Red Cross since the attack on Pearl Harbor is shown by the increase in the number of inquiries from persons desiring to enroll as medical technologists. In contrast to the 1,061 inquiries received from June 30 to November 30, 1941, a period of 5 months, there were 1,357 inquiries received during the month of December alone.

*The Doctors for Britain Project*—In cooperation with the Office of Insular and Foreign Operations, the Medical and Health Service has assisted in answering the appeal of the British Red Cross to the American Red Cross to enroll American doctors to meet the shortage of doctors in British military and civilian hospitals. The doctors recruited are serving on the staffs of the Emergency Medical Service and in the Royal Army Medical Corps.

*The Project for the Correction of Remediable Defects of Registrants Rejected for Military Service*—The project for the correction of remediable defects of registrants rejected for military service was undertaken at the request of the Medical Advisory Committee of National Selective Service, and was a cooperative project of Selective Service, the District of Columbia Medical Society, the District of Columbia Dental Society, the Health Security Administration of Washington, D. C., and the American Red Cross. Objectives of the study were:

1. To determine the number of deferred registrants with remediable defects
2. To determine the number willing to have such defects corrected

3. To estimate the cost of remedying such defects

The findings of this study are now being used by Selective Service in estimating costs in state-wide rehabilitation projects.

*The Blood Donor Service*—In January, 1941, the American Red Cross and the National Research Council were requested by the Surgeons General of the Army and Navy to organize a cooperative project for collecting human blood to be processed into dried plasma for the medical departments of the Army and Navy.

The American Red Cross with the help of certain Chapters in the larger cities is responsible for enrolling the volunteer donors, safeguarding their interests, and delivering the blood collected to licensed biological companies who have contracted to process plasma. The Medical Division of the Research Council is responsible for instituting and directing all the technical phases of the work, particularly as it relates to the technic of taking blood from the donor and selecting or approving the collecting units to be used.

The original request presented by the Surgeons General called for the collection of a minimum of 10,000 pints of blood plasma to be dried and to be available for treatment to the armed forces. In May, 1941, the amount requested was increased to 215,000 units. This amount was increased materially following the attack on Pearl Harbor and the declaration of war. All told, a total of 1,280,000 units have been requested as of April 4, 1942.

To meet these requests, the Red Cross has opened Blood Donor Centers as rapidly as laboratory facilities to process the blood have become available. On December 7, 1941, 9 Centers were in operation. As of April 4, 1942, 18 Centers are in operation. 217,731 pints of blood have been collected, and total donations are being obtained at

the rate of more than 17,000 a week.

Blood collected by the 18 Red Cross Centers is shipped daily in refrigerated containers to the laboratories which have agreed to process it into dried plasma for the Army and Navy. Because of the many technical and financial factors involved, including the fact that the blood must reach the laboratory within 24 hours after it is drawn, the location of Centers has been restricted to areas near cities in which the processing laboratories are located.

Volunteers have responded willingly to the Red Cross call, and numerous cases have been reported in which emergency transfusions of plasma have saved or helped to save the lives of wounded American soldiers and sailors. Arrangements have also been made whereby emergency supplies of dried plasma will be available through the Red Cross in event of civilian disaster in this country.

Red Cross Blood Donor Centers are located in New York, Philadelphia, Baltimore, Buffalo, Rochester (N. Y.), Indianapolis, Detroit, Pittsburgh, St. Louis, Boston, Cleveland, San Francisco, Milwaukee, Los Angeles, Chicago, Cincinnati, Brooklyn, and Washington, D. C.

#### THE FUTURE

Today the activities of the American Red Cross are focused on meeting the demands of adequate defense and the needs of our fighting forces. But when the war is over and victory is secured, needs of reconstruction in this country and all over the world will tax the resources not only of the Red Cross but of all other agencies of good will. As the appeal came and was met after the last war, so it will be met again. In providing these services the Red Cross will not have to be called in—it will be there.

# A New Technic of Health Education for Use in Baby Stations

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INTEREST in the use of tests as a technic for motivating the general public to acquire information has recently been stimulated by the use of quiz corners as teaching devices in health education and other fields.\* In Newark, N. J., the Baby-Keep-Well Stations have adapted with considerable success the popular quiz session to an educational purpose, through the employment of "True or False" contest methods with groups of mothers who attend conferences.

As originally planned, using true-false statements as an educational device had as its primary objective instructing mothers in proper procedures for infant care. When the plan was put into operation, however, it developed that it was equally valuable for other purposes. It pointed out to the physicians those facts about baby care that were relatively or completely unknown to many of the mothers, and it also uncovered a number of wrong ideas which the mothers had. By concentrating on facts that were unknown and on the correction of wrong impressions, the physicians were able to make their instruction much more profitable. Furthermore, if he had previously

taught some point now being tested, a physician could judge how effective his instruction had been.

The test questions constructed for initial trial dealt with the following phases of maternal and child hygiene:

- Feeding
  - Artificial or bottle feeding
  - Breast feeding
  - Cod liver oil
  - Orange juice
- Development
  - Habit training
  - Sleep
  - Teething
- Common infant disorders
  - Constipation
  - Cradle cap
  - Crying
  - Diarrhea
  - Vomiting
- Care of diaper and skin
- Clothing
- Fresh air

The questions were prepared by the physicians and were, in general, based on actual experiences at baby stations.† Many of them were intended to present mistaken or commonly held ideas such as: "Crying injures a baby's lungs." "Teething causes colds." "Belly bands keep the back straight."

After the first contests in the fall of 1940, succeeding ones have been con-

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\* See, for example, "Using Tests as a Medium for Health Education," Mayhew Derryberry and Arthur Weissman, *Public Health Reports*, vol. 55, 1940, pp. 485-489, and "The Quiz Corner as a New Informational Technique," Bureau of Agricultural Economics, United States Department of Agriculture, July, 1941.

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† The use of the quiz session in Baby-Keep-Well Stations and the original set of questions were suggested by Dr. Ralph N. Shapiro, a member of Dr. Levy's staff.



ducted at intervals ranging from 1 to 3 months, with from 5 to 15 participants at each. The physicians at the stations have, in each instance, announced the date of a contest several weeks in advance and reminded the mothers in the interval. In addition to the physician's reminder, the nurses during home visits have encouraged mothers to attend.

Although in general the quiz sessions have been conducted as contests, a few physicians have preferred to omit the competitive feature and have, instead, a question-and-answer period. In each instance the physician introduced the session with a brief informal talk in which he explained the method that would be used, and usually compared it with the radio quiz programs with which most people are familiar.

In conducting the contests, two distinct methods have been used. When the first method is followed, each mother in turn is asked a question. About 25 questions are used, so that each participant has an opportunity to answer once or twice, to give reasons for her own answers, and to comment upon those given by others. According to the second method, the group is divided into competing teams. The division may be arbitrary, based on seating arrangement, for example, or on some characteristic such as the number of children a mother has. In the team arrangement the usual method of scoring has been to give one point for each correct answer and an additional one or two points' credit for a correct explanation or reason for the answer. If the individual who gives the correct answer (true or false) cannot also furnish a correct explanation, the other side is given a chance to do so. The physician who conducts the contest also briefly summarizes the information after each question has been discussed.

In the time allotted to a contest with its attendant discussion (usually less than an hour) the physicians find that

they can use 18 to 25 questions, selecting those pertinent to the problems most commonly found in their particular stations. Since there are available 160 questions\* from which to select, the physician has considerable latitude with respect to the topics he may wish to have discussed. By conducting the contest before the child health conference, it has been found that in general attendance has been improved.

Since the true-false contest was a new technic in health education, there was need for some evaluation of its effectiveness, when used by several physicians, before its real value could be determined. In order to find out more exactly how the method operated, stenographic transcripts of contests conducted by 7 physicians, each in a different health station, were taken between November, 1940, and April, 1941.

Five of the physicians used about 25 questions each, but the other 2 used 146 and 62, respectively. In the latter two contests, the percentage of questions about which there was no comment, discussion or explanation was 60 in the first case, and 90 in the other. The doctor sometimes said, "Yes, that's right," or "No, that's wrong," but gave no further interpretation. It would appear that at least those two contests achieved only a very limited amount of teaching, since there is nothing in the record to indicate that the physicians even made certain that correct answers were not the result of guess work.

Contrasted with the type of contest which is little more than a recital of questions are the other 5 of the 7 analyzed. There was discussion and explanation in over 90 per cent of all instances and in no case was a question passed by without some comment. In

\* Mimeographed copies of the questions are available for limited distribution on request directed to the Health Department of the City of Newark, N. J., or to the Division of Public Health Methods of the National Institute of Health at Bethesda, Md.

two of the contests there was not a single question to which the answer was not discussed.

In the type of situation when there is secured not merely information in the form of discrete items of fact, but an understanding of related facts and an explanation of reasons, it is surely fair to say that real teaching has been achieved. The physician, therefore, has opportunity to find out what the participants know or do not know and also to present new or unfamiliar information, correct wrong impressions, and make sure that reasons are properly related to practice. That can only be done, however, if the physician observes certain cautions in using the contest technic in his child health station. As one observer remarked after seeing a true-false contest: "The success of the contest depends almost entirely upon the person who runs it, and how he does it." The manner in which the physician conducts the quiz is most important to the effectiveness of this method of teaching mothers. This implies active participation by the physician, not a mere recital of a series of items.

The first two contests discussed above illustrate test situations in which the educational value was reduced and definitely limited by the use of large numbers of questions. Mere recital of questions consumed a major part of available time and allowed little or no explanation. The "all right," "yes," "that is correct" type of comment by the physician serves as praise for the one participant to whom it is directed and is a source of satisfaction only to her. However, others present can derive no educational benefit from non-informative comment; hence a valuable opportunity for teaching is lost when there is not additional explanation of answers. Such discussions need not be long or very detailed. The following transcripts emphasize the importance of the physician's position as educator:

1. Always shake a lot of powder on the buttocks when the baby wets. True or false?

*Doctor A*

Mother: False.

Dr.: Why is that wrong?

M.: It's not necessary. It sticks and cakes. You can oil the baby, use olive oil. For one thing, I have heard you can give the baby pneumonia from the dust.

Dr.: This mother has thought about this. It will cake around the creases. Dust the powder on a puff and put it on. But the baby cannot get pneumonia from putting powder on the buttocks.

*Doctor B*

Mother: False.

Dr.: Correct.

2. Never use table sugar in the formula—there is not enough nutrition in it. True or false?

*Doctor A*

M.: False.

Dr.: Why?

M.: Because I never heard of any other kind of sugar to use for a baby.

Dr.: Table sugar is just as good for a small baby as any other sugar. Only in special cases do we use other sugars.

*Doctor B*

M.: That is false.

Dr.: You are right.

3. Teething causes colds in babies. True or false?

*Doctor A*

M.: False.

Dr.: Why?

M.: Teething does not cause any kind of illness. Baby may not have been dressed properly. It may have been in a draft.

Dr.: That is what we are trying to bring out. Teething only causes teeth.

*Doctor B*

M.: False.

Dr.: That's right.

In any evaluation of the quiz technic in health education, it is necessary to consider, in addition to its effectiveness in terms of learning, the attitude that it

produces in participants. The following transcripts are indicative:

Physician: I should like to ask you mothers what you think of these contests. Do you like this method?

Participant: Very much.

Physician: Do you think it makes much difference if you know *why* things are done?

Participant: I think if you know *why* you do these things, you are more apt to *do* them, and do them *right*.

Physician: Do you like this session, mothers?

Participant: Yes. Very much.

Physician: All of you?

Participants: Yes. You learn something. Have questions on older children next time.

The physicians conducting the contests have also expressed their opinions of the technic in such ways as:

Dr. A: I think it's the best means of getting discussion. It's the best way the Baby Station can get all the mothers to take part.

Dr. B: The contests are nice, but I think the information you want to get across is better delivered by the 5 or 10 minute talks we give all the mothers before each conference. The contests are popular though, the mothers make mistakes and all laugh, and we have a lot of fun.

Dr. C: The best plan is to have the contest before the conference. In that way you have better interest and more mothers stay.

Dr. D: About 40 or 45 minutes is the optimum length of time for the contest. It doesn't work well if you take much more time than this. And each station should space them at least 3 months apart. You can't have the quizzes more often than that if you want to keep the mothers interested in the game. But 3 months is just about the right time to repeat the contest with the same mothers.

The discussion and the quoted comments and criticisms above, taken together, highlight the characteristics of a good contest. Briefly stated, these may be considered the following:

1. *Participation* by all who attend.
2. *Informality* and the "game" spirit.
3. *Emphasis* on subjects of current interest and also on subjects unknown or relatively unknown to the participants.
4. *Adequate discussion* and explanation of the reasons for the answers.

5. A *coördination and summary* (on the part of the physician) of the information brought out during the discussion.

6. *Length* not to exceed 40 to 45 minutes for maximum interest to the participants.

Through the use of the True-False contest in baby stations, one of the primary interests motivating mothers to attend child health conferences is satisfied. The mother's desire for service and information brings her to the station. Physical examination of the baby, and the physician's recommendations constitute the service, but the mother also receives information on maternal and baby care during the conference.

The health education technic described here can increase the amount of information about maternal and child hygiene which the mothers get and can also aid physicians to determine where teaching is most needed and how it will be most effective.

#### SUMMARY

1. An adaptation of the popular quiz program has been introduced in baby stations.

2. Quiz contests can assist a baby station physician in giving information about maternal and child hygiene and thus aid in educating mothers in adequate health procedures by a popular technic, new in the field of public health education.

3. By means of contests, both physicians and mothers learn. The physician finds what subjects of maternal and child hygiene require special emphasis because they are unknown or relatively unknown to the mothers—information that can be utilized in improving subsequent child health conferences.

4. How the contest is conducted depends principally upon the physician who serves as moderator and educator in the test situation. The amount of teaching done is directly related to the way in which the quiz period is handled by the physician.

5. Characteristics of a good contest are:

- a. *Participation* by all the mothers
- b. *Informality* and the "game" spirit
- c. *Emphasis* upon subjects of current interest and other pertinent problems
- d. *Adequate discussion* and explanation of reasons for answers
- e. *Coördination and summary*, by the

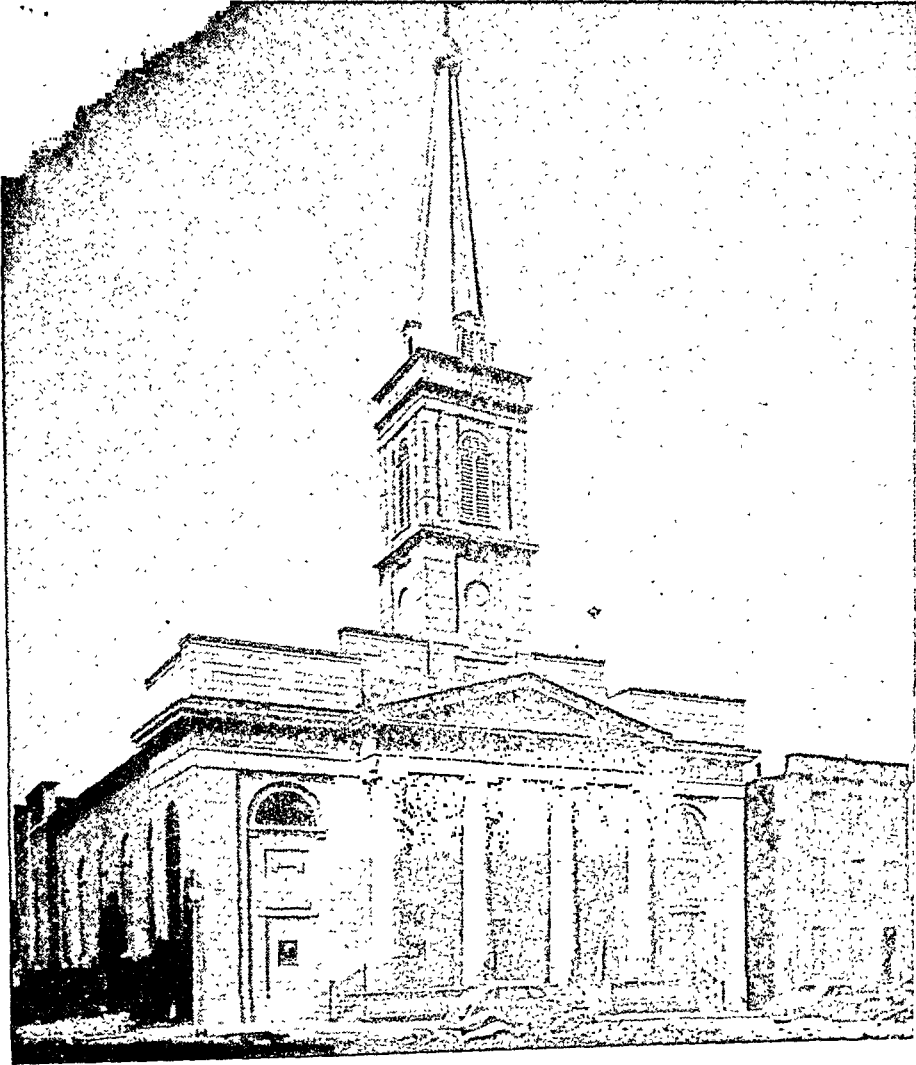
physician, of the information brought out during the discussion period.

f. Length not to exceed 40 to 45 minutes for maximum interest.

6. Contests not having the characteristics

above have little value in health education.

7. Although it has not been experimentally demonstrated, it is believed that variations of the quiz technic can be used in other types of public health clinics.



*For frontier prayer when St. Louis was young was the Old Cathedral, which still stands on the river front.*

# Development of Tuberculosis and Changes in Sensitivity to Tuberculin in an Institution for the Feeble-minded\*

A Ten Years' Study

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IN 1930 a survey was made of the inmates of the Walter E. Fernald State School in Massachusetts, an institution for the feeble-minded, primarily for the purpose of studying the comparative sensitiveness of the Pirquet and Mantoux methods of tuberculin testing, but with a view also to determining the extent of the tuberculosis problem in this hospital.<sup>1, 2</sup> All inmates were tuberculin tested and given an x-ray of the chest. Ten years later as many of these individuals as were still living at the school were reexamined to determine what changes had occurred in their sensitivity to tuberculin and in their x-ray findings. Both surveys were conducted by the staff of the Division of Tuberculosis, Massachusetts Department of Public Health, with the cooperation of the institution staff.

The number originally tested and x-rayed was 1,656, of whom it was possible to reexamine 1,023, in addition to reviewing the records of those who had died in the school during the interim. All inmates had been given an intracutaneous tuberculin test with 0.01 mg. of old tuberculin, and those who

failed to react had been retested with 1.0 mg. Unfortunately, a record was not preserved of the individual reactions to different dilutions of tuberculin in 1930, all reactors to either 0.01 mg. or 1.0 mg. being recorded as "positive" on the medical records. However, a table was available showing the distribution of positive and negative reactions to the two dilutions by age groups in 1930. The same technic of intracutaneous testing was followed in 1940 as closely as possible. In both surveys the tests were performed and reactions interpreted by physicians experienced in this work. It is recognized, however, that there were variables which could not be entirely eliminated, such as variations in the lots of tuberculin used and individual differences in the interpretation of skin reactions and reading of x-rays.

Owing to the lack of adequate facilities, inmates found to have tuberculosis could not always be segregated from others as completely as was desired, and it will be seen that the original non-reactors frequently developed a positive test while in the institution. For the purposes of this study we are not concerned with the 51 inmates found to have significant tuberculosis in 1930, of whom 34 were again x-rayed in 1940,

\* Read before the Epidemiology Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 14, 1941.

TABLE 1

*Tuberculin Reactions by Age in 1930 and 1940*

1930								1940							
Age	Number Tested	Pos. to 0.01 mg.		Pos. to 1.0 mg.		Total Pos.		Age	Number Tested	Pos. to 0.01 mg.		Pos. to 1.0 mg.		Total Pos.	
		No.	%	No.	%	No.	%			No.	%	No.	%	No.	%
5-9	56	14	25	8	14	22	39	15-19	43	23	53	6	14	29	67
10-14	269	92	34	58	22	150	56	20-24	161	104	65	22	14	126	78
15-19	384	225	58	70	18	295	77	25-29	172	125	73	24	14	149	87
20-24	255	183	72	32	13	215	84	30-34	159	146	92	4	3	150	94
25-29	147	127	86	8	5	135	92	35-39	117	107	91	6	5	113	97
30-39	275	249	91	19	7	268	97	40-49	197	188	95	8	4	196	99
40-49	186	163	88	19	10	182	98	50-59	125	118	94	6	5	124	99
50 & over	84	70	83	10	12	80	95	60 & over	49	43	88	5	10	48	98
All ages	1,656	1,123	67.8	224	13.5	1,347	81.3	All ages	1,023	854	83.5	81	7.9	935	91.4

Mean age of inmates tested in 1930: 25.9 years

Mean age of inmates retested in 1940: 38.3 years

the other 17 having died. Also excluded from consideration were 14 cases reported to have died of tuberculosis whose 1930 x-ray films had been lost or destroyed, so that they could not be said with certainty to have been free from tuberculosis when first examined. For every person included in this study and classified as having died of tuberculosis or found diseased in 1940, we have the 1930 x-ray and have agreed upon reviewing it that the patient was free from pulmonary tuberculosis at that time.

An analysis of the results of the tuberculin testing by age in 1930 and 1940 is presented in Table 1. Each line in this table refers to a particular group of inmates; *e.g.*, the 43 children shown as having been retested in 1940 in the 15-19 age group are members of the group of 56 who were tested in the age group 5-9 in 1930. This arrangement was made to facilitate the comparison of the same groups over the period. This table shows that the individuals tested in 1930 now have a higher incidence of positive tests in each age group, as would be expected after an interval of 10 years. In order to compare the percentages of reactors in similar age groups at the time of testing, one should refer to Table 2, in which it is seen that for the same age groups the percentages were higher in 1930 than in 1940 up to

the fourth decade of life, after which they remained close to 100 per cent in both years. This also might be expected in view of the general reduction in tuberculosis morbidity and mortality in the community.

TABLE 2

*Percentages of Reactors in 1930 and 1940 by Age at Time of Test*

Age Group	Per cent of Reactors to 0.01 or 1.0 mg. Tuberculin	
	1930	1940
15-19	77	67
20-24	84	78
25-29	92	87
30-39	97	95
40-49	98	99
50 and over	95	99

Turning now to the study of individuals, we have shown in Table 3A what happened to those who failed to react to the test in 1930. Here the age groupings are those of the original test period. Of the 131 persons whose tests were negative in 1930, 72, or 55 per cent, became reactors over the 10 year period. The application of the Chi-square test to the series indicates that the differences in frequency of conversion of a negative to a positive test by age are not statistically significant and could be due to chance. The same is true of the difference by sex, as seen in Table 3B.

TABLE 3A

*Findings on Retest in 1940 of Previous Non-reactors, by Age*

Age (As of 1930)	Number Retested	Number Positive to 0.01 mg.	Number Positive to 1.0 mg.	Total Number Positive	Expected Number Positive	Per cent Positive
5-9	22	7	3	10	12.1	45
10-14	56	25	10	35	30.8	62
15-19	33	14	5	19	18.1	58
20 and over	20	4	4	8	11.1	40
All ages	131	50	22	72	72.0	55

Value of Chi-square=4.02.

Probability of this age distribution in conversion to a positive test occurring by chance is  $> 0.2$ .

TABLE 3B

*Findings on Retest in 1940 of Previous Non-reactors, by Sex*

Sex	Number Retested	Number Positive to 0.01 mg.	Number Positive to 1.0 mg.	Total Number Positive	Per cent Positive
Males	93	39	16	55	59
Females	38	11	6	17	45
Difference (males-females)	..	..	..	..	$14 \pm 9.5$

When we study the frequency with which tuberculin-positive individuals became negative, we find, as Table 4A shows, that the average frequency of reversion is 3.3 per cent over a 10 year period, but that the frequency is distinctly higher in the younger age groups. For all persons under 15, it is 12.7 per

cent; for those over 15, 1.7 per cent. The difference is  $11.0 \pm 3.0$ , which is statistically significant. In other words, the excess in reversions of a positive test to negative among children is greater than one might expect from chance alone. Table 4B shows that males and females behaved alike in this respect.

TABLE 4A

*Findings on Retest in 1940 of Previous Reactors, by Age*

Age (As of 1930)	Number Retested	Number Who Remained Positive	Number Who Became Negative	Per cent Who Became Negative
5-9	21	19	2	10
10-14	105	91	14	13
15-19	139	130	9	6
20 and over	627	623	4	1
All ages	892	863	29	3.25
5-14	126	110	16	12.7
15 and over	766	753	13	1.7
Difference	..	..	..	$11.0 \pm 3.0$

TABLE 4B

*Findings on Retest in 1940 of Previous Reactors, by Sex*

Sex	Number Retested	Number Who Remained Positive	Number Who Became Negative	Per cent Who Became Negative
Males	519	502	17	3.3
Females	373	361	12	3.2

TABLE 5

*Institutional Deaths from Tuberculosis Between 1930 and 1940, by Age and Result of Test in 1930*

Age Group (1930)	Among Non-reactors		Among Reactors	
	Number Tested (1930)	Deaths	Number Tested (1930)	Deaths
5-9	34	1	22	..
10-14	119	2	150	..
15-19	89	3	295	..
20-24	40	3	215	3
25-29	12	..	135	1
30 and over	15	..	530	1
All ages	309	9	1,347	5
Per cent dying of tuberculosis		2.9	...	0.4%
Difference (reactors-non-reactors)		2.5±1.0		

Tables 5 to 8 deal with the frequency of clinical tuberculosis in the group. Fourteen deaths during the 10 years were ascribed to tuberculosis. Autopsy was obtained in 6; positive sputum was reported in 3 others; in another group of 4, while no sputum reports are found, there were typical tuberculous lesions in the lungs by x-ray. The remaining case died after transfer to another institution, of tuberculous meningitis. One of the autopsied cases also died of meningitis.

Table 5 gives the age distribution of those dying of tuberculosis between 1930 and 1940, and classifies them according to their previous tuberculin reactions. It also shows the deaths as percentages of the number tested in 1930, or roughly as mortality rates. It should be realized, however, that the percentages given are not true mortality rates because the population at risk was declining somewhat during the period and was not equal to the original number tested; furthermore, the time interval was 10 times that conventionally used in computing death rates. It will be noted that the mortality rate over the 10 year period was significantly higher among previous non-reactors than reactors, and that the non-reactors who died were on the whole younger than the reactors; this latter finding is of course due to the fact that most of

the non-reactors were found in the younger age groups.

TABLE 6

*Cases of Tuberculosis Discovered in 1940 Survey, by Age*

Age Group (1930)	Number X-rayed (1940)	Cases Found
5-9	43	..
10-14	161	2
15-19	172	1*
20 and over	647	4
All ages	1,023	7

\* This was the only case found in a previous non-reactor.

In Table 6 are shown the ages of patients diagnosed as having pulmonary tuberculosis in the 1940 survey. Table 7

TABLE 7

*Incidence of Tuberculosis, Including Both Deaths Prior to 1940 and Cases Discovered in 1940, by Result of Original Test*

	Reactors	Non-reactors
Number tested in 1930	1,347	309
Cases of tuberculosis subsequently developed	11	10
Per cent	0.8	3.2
Difference (reactors-non-reactors)		2.4±1.0

presents the incidence of tuberculosis, including both deaths and newly diagnosed cases, basing the rates upon the numbers of reactors and non-reactors when tested in 1930. Here again the disease appears with significantly greater frequency among non-reactors. Five of the newly diagnosed cases and 8 of the deaths were males.



TABLE 8

*Interval Between Original Test and Death from Tuberculosis, by Result of Test*

<i>Number of Years Between Original Test and Death</i>	<i>Original Reactors</i>	<i>Original Non-reactors</i>	<i>All Inmates with Negative X-ray in 1930</i>
0-4	..	..	..
5	1	1	2
6	1	..	1
7	2	4	6
8	1	2	3
9	..	1	1
10	..	1	1

Table 8 shows the intervals which elapsed between the study in 1930 and the time of death, for those inmates who died of tuberculosis after having had a normal chest x-ray. There were no deaths in the first 4 years; and the previous reactors appear, on the whole, to have died somewhat earlier than the non-reactors.

When the cases were classified by the hospital buildings occupied at the time of the 1940 survey, it was noted that 3 of the 7 living cases of tuberculosis first diagnosed at this time were from one section, North Building. The incidence here was 3 out of 116 x-rayed, as contrasted with 4 out of 907 x-rayed in the rest of the institution. Three of the 14 patients who died of tuberculosis prior to the 1940 survey were recorded as living in this same building at the time of the original survey.

Furthermore, out of the 116 resurveyed inmates of North Building, there were 13 non-reactors who became reactors, and the percentage of positive reactions, both for the entire building and within the age groups separately, was higher than in the rest of the institution. The median age of inmates of North Building was 21.6 as against 24.2 for the entire school.

The crude incidence of positive reactions was 96 per cent for North Building, and 90.8 per cent for the rest of the institution; this difference is statistically significant. It is also of interest that there were no reversions of a positive test to negative in this building. North

Building houses the male inmates of lowest mentality whose mental condition makes them least capable of observing rules of hygiene.

#### COMMENT

This group provided an unusual opportunity for investigation of the epidemiology of tuberculosis. Most similar studies are conducted with persons followed for varying lengths of time, which necessitates the use of a method of analysis based on "observation years" or the adaptation of the life table principle. Both of these methods are undesirably complex, and the observation years method fails to take into consideration varying degrees of risk to which persons may be subject at different periods after the beginning of observation. No such calculations were here necessary, because the entire group was followed for the same fixed period of time.

Our interpretation of the data on incidence of infection by age is that, for inmates under the age of 30 at least, the total exposure to tuberculosis in their homes and since entering the institution has been less than it was 10 years ago for the corresponding age groups. This requires the assumption that the 633 patients discharged, paroled, or dying subsequent to 1930, did not differ from those who remained, with respect to tuberculous infection. The figures also show, however, that fairly heavy exposure has continued within the school, for there has been a considerable increment of persons infected since 1930 in each age group up to 30 years of age. That the total exposure of this group has been greater than that of public school children, for example, is shown by Table 9, which contrasts them with other groups surveyed by the department.

Why the re-test should show a higher frequency of reversions from positive to negative in the younger age groups we cannot explain. More evidence to con-

TABLE 9

*Comparative Results of Tuberculin Testing with 0.01 mg. O. T. in Massachusetts*

Group	Year Studied	Average Age	Number Tested	Per cent Positive to 0.01 mg. O. T.
Urban High School children	1939-1940	{ 14-15	4,618	24.9
		{ 15-16	4,302	29.9
		{ 16-17	3,796	33.1
		{ 17-18	3,066	36.7
Civilian Conservation Corps enrollees	1937	20.5	1,115	44.8
Medical and Dental School freshmen	1936-1938	22	472	41.3
Fernald School inmates	1940	{ 15-19	43	55
		{ 20-24	161	65

firm or refute this finding should be obtained before an explanation is offered.

The higher incidence of tuberculosis in initial non-reactors was of particular interest to the authors because of our own studies indicating that public school children with a positive reaction develop tuberculosis more often than non-reactors.<sup>3</sup> Many advocates of both views can be found; the majority probably look upon the uninfected person as showing a higher incidence. We do not feel that the results of this study are necessarily incompatible with those referred to above, because the groups studied differed widely in composition and environment. The public school children were living normal lives in an environment which usually afforded little exposure to tubercle bacilli, as shown by the small annual increase in percentage infected. In the Fernald School, on the contrary, there was heavy exposure, as indicated by the more rapid rise in the proportion infected with increasing age.

A hypothesis to fit these observations can be advanced with the aid of the following assumptions: First, that pulmonary tuberculosis can develop in the previously infected person, both from fresh infection or superinfection, and from endogenous reinfection. Second, that the previously uninfected person is more likely to break down than the infected one, when heavily exposed to

tuberculosis—that is, that old infection confers some protection against disease resulting from new exposure. Then one may expect that, in persons whose environmental contact with tuberculosis is heavy and continuous, most of the cases will develop among previous non-reactors; while among persons with little exposure, a relatively large proportion of cases will result from endogenous reinfection, the total number of such cases being of course much smaller than in the former group. In other words, among the public school children endogenous reinfection played a relatively important rôle, while in the Fernald School it was overshadowed by the part played by continued contact with tuberculosis. The percentage of reactors to tuberculin in the second and third decades is well above that encountered in other groups which the department has tested recently. The comparison is made on the basis of reactions to 0.01 mg. of tuberculin because of the fact that only this strength was used in the other groups.

It will be noted that the inmates were not classified and studied according to their exposure to tuberculosis within the institution. This was because it was not felt that such a classification could be made with accuracy in view of the presence of tuberculosis cases which could not be entirely segregated, and the poor hygiene practised by these patients.

Attention is called to two other recent studies which dealt with similar material. Flahiff<sup>4</sup> found that among persons admitted to a mental hospital in Jamaica, B.W.I., where tuberculosis was prevalent, the rate of onset and the death rate from the disease were higher in those who did not react to tuberculin on admission than in those who were sensitive to tuberculin on admission. Plunkett, Weber, Siegal and Donk<sup>5</sup> made an investigation of the inmates of a state school for mental defectives in New York State which showed a marked difference in the frequency of development of a positive tuberculin test and incidence of tuberculosis, depending on whether the individual was exposed to an infectious case. Every case of reinfection type tuberculosis which developed could be associated with the presence of an infectious case in its immediate environment. It was noted that the rate of change from negative to positive reactions was higher in all age groups among males. We found a similar sex difference in the total number of non-reactors who became positive, but it was not statistically significant.

#### SUMMARY AND CONCLUSIONS

Of 1,656 inmates of a school for feeble-minded who had been tuberculin tested and x-rayed in 1930, 1,023 were restudied in 1940. The percentage of

positive reactors was somewhat higher than in 1930, but when compared by age groupings at the time of the test, there was a slight falling off up to the age of 30.

Former reactors reverted to a negative state more often under the age of 15 than above this age. Tuberculosis developed most frequently, and conversions from a negative to a positive tuberculin reaction were most common among inmates of the building for patients of lowest mental status.

The subsequent incidence of tuberculosis was higher among those who failed to react to tuberculin in 1930 than among the reactors.

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# Food Establishment Sanitation in a Municipality\*

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IT is true as Rosenau<sup>1</sup> has said that all public health work is based upon the four fundamental needs of human welfare, namely, food, shelter, defense, and propagation. The safeguarding of the food supply of a community, it appears then, is one of the essential functions of a health department. The responsibility for the inspection of food establishments in municipalities is almost invariably assumed by this department. In states, as well, this responsibility is generally vested in health departments.

The fundamental principles of sanitation of food establishments require that the protection of the health of the consumer against dangerous foods and the general cleanliness and appearance of the establishment be given first consideration. This combined activity requires all-out efforts of the food inspection personnel; it is not really a health department function to be active in preventing fraudulent trade practices.

Slack<sup>2</sup> has pointed out that during recent years the conception of the duties of the food inspector has undergone a great and important change. Whereas formerly his activity was largely devoted to the search for adulterated, spoiled, and unwholesome food, and prosecution of the dealer, the intelligent food inspector of today seeks to co-operate with the dealer to insure the

marketing of foods of high quality. It is, as he says, the joint responsibility of the producers, the dealer, and the inspector to see that the food offered to the public should not present a health hazard, whether from the viewpoint of containing disease producing organisms or from any other of the various ways in which food may be harmful to health.

## PRIMARY OBJECTIVE OF FOOD ESTABLISHMENT INSPECTION

The primary purpose of food establishment inspection from the public health point of view is to prevent food poisoning and infections transmitted by food. In order to prevent illnesses the underlying causes must be known. Then there must be developed a practical procedure for applying the means of prevention.

To prevent food illnesses, the causes of which are given in Table 1, the combined sciences of bacteriology, chemistry, engineering, epidemiology, pedagogy, toxicology, and statistics must be applied. For example, in combating botulism, familiarity with both bacteriology and canning principles is necessary. Consumers and merchants must be informed of the necessity for destroying spoiled canned food. Cannery and housewives must be taught that specific times and temperatures must be adhered to for each product canned.

Familiarity with the Salmonellas, a study in itself, must be had. Havens<sup>3</sup>

\* Read at a Joint Session of the Engineering and Food and Nutrition Sections of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 15, 1941.

TABLE 1  
Causes of Food Poisoning and Infections

	<i>Foods Often Implicated</i>	<i>Usual Time of Onset</i>
<i>Of Bacterial Origin</i>		
<i>Clostridium Botulinum</i> toxins	Improperly processed canned and bottled food	12 to 24 hours
<i>Staphylococcus enterotoxin</i>	Custard pastries, cooked ham, hollandaise sauce, sliced cooked meats	3 to 6 hours
<i>Salmonella</i> infections	Sliced cooked meats, meat and poultry salads, "warmed over" foods, custard-filled pastries	6 to 18 hours
Enteric infections	Oysters, raw milk, other dairy products Salads, "warmed over" foods, milk and other dairy products Wild rabbits (by handling)	3 to 38 days
Typhoid fever		1 to 7 days
Bacillary dysentery		1 to 10 days
Tularemia		
<i>Of Nonbacterial Origin</i>		
Inorganic chemicals Arsenic, Lead Fluorides Antimony Cyanides Cadmium, Zinc Copper, Barium Others	Any food accidentally contaminated	Several minutes to hours, depending upon dosage
Poisonous animals and plants	Rhubarb leaves, mussels in certain seasons, poisonous mushrooms, poisonous fish	Variable
Animal parasites	<i>Trichinella</i> in pork <i>Diphyllobothrium</i> in some fish <i>Taenia</i> in beef	Several days to weeks
Allergies and environmental circumstances	Specific foods consumed by persons allergic to these foods Consuming food while exposed to dangerous gases (CO), high temperatures, etc.	Immediate to several hours

states, "No other group of bacteria, with the possible exception of the streptococci, present such a varied assortment of bacteriological problems, pathological manipulations, and epidemiological peculiarities as do those closely related bacteria of which the paratyphoids may be taken as the type." Preventing the *Salmonella* type of food poisoning requires teaching skill. Public health educational methods must be applied to teach individuals and groups of food handlers to keep clean, to bring into use ample lavatory facilities conveniently installed, and to bring about efficient refrigeration of ready-to-eat foods. In this latter effort, the fundamentals of refrigeration must be known;

often it is extremely advantageous to call upon the engineer for specific instruction in refrigeration engineering.

In order to prevent infections of food by the enterotoxin producing *Staphylococci*, it must be recognized that open sores and skin abrasions in food handlers are possible sources of these organisms. The reheating of custard-filled pastries as suggested by Stritar, Dack, and Jungewaelter,<sup>6</sup> and Gilcreas and Coleman,<sup>7</sup> must be explained in detail to bakers. Chefs in hotel kitchens must be taught the reason why hollandaise sauce should be discarded within 4 or 5 hours after it has been made. Meat plant operators under both federal and municipal supervision must be con-

vinced that the newer type of ready-cooked and tenderized hams should be processed, prepared, and wrapped with a minimum amount of hand contact, and that regular medical inspection for skin abrasions should be maintained for all persons touching this type of food.

While the investigation of cases and outbreaks of typhoid fever and dysentery is the duty of the epidemiologist, material aid can frequently be given by the food inspection personnel, particularly in preventing recurrence of these diseases. A review of records of receipts and sales of shellfish dealers facilitates tracing shellfish to their source if this food is implicated. Known typhoid fever carriers must be convinced of the danger of handling food intended for others and for the need of voluntarily withdrawing from such activities. Dysentery infections may be prevented by applying the same methods as for the *Salmonella* infections. Tularemia can be prevented by banning the sale of wild rabbits. The enforcement of this prohibition requires the patrolling of railroad and truck terminals and wharves during certain seasons and can be carried out along with the enforcement of the compulsory shellfish certification requirement. All milk sold in a municipality should be pasteurized under the supervision of personnel trained for this duty.

Food illnesses caused by poisonous chemicals can be prevented by equipping the food inspector with simple testing outfits. Fluorides, arsenic, and cyanides can be detected readily by means of such portable equipment. Enforcing restrictions against the use and sale of fluorides, except of the tinted variety, prohibiting the use of cyanide-containing metal polishes in food establishments, and advising against the use of bare copper, galvanized and cadmium-plated, and some types of gray agateware food containers, and poisonous chemicals employed as insect and

rat eradicators, should be a part of the daily routine in guarding against food contamination by poisonous chemicals.

The importance of thorough cooking of pork and some fresh water fish should be explained to food merchants and consumers and also to civic, educational, and religious organizations, as an effective means of preventing illnesses caused by parasites found in these foods.

Information concerning poisonous plants and animals, the fact that food consumed under certain unfavorable environmental conditions may cause symptoms resembling food poisoning, and that certain individuals may be allergic to some wholesome foods, should be emphasized to food merchants and consumers at group meetings.

#### COÖPERATION WITH FOOD INDUSTRY ESSENTIAL

It is essential that the coöperation of representatives of the food industry and others be obtained, for it can readily be seen that in attempting to protect the consumer against the food-borne diseases, education and coöperation are the principal weapons of the health officer. Except in some instances, as for example, the prohibiting of the sale of wild rabbits to prevent tularemia and cyanide silver polishes in food establishments, legislation cannot be used as the only preventive measure. The food handler must be instructed in the fundamentals of food sanitation. Education of the employed food handler, however, can be effective only when the owner of the food establishment endorses such a procedure. The effectiveness of compulsory medical examination of food handlers is still debatable among public health officials, with the majority apparently not in favor of this costly procedure. Education of food handlers seems to be supplanting this old-time practice. The reheating of custard-filled pastries, exerting care in ham processing and handling, and the washing of hands

after leaving the toilet require the wholehearted interest and coöperation of the industry with the health official. Supervisory personnel of organizations within the food industry can be trained in relatively short periods of time and used as unofficial food inspectors of their own organizations and, with the coöperation of the industry, can be of valuable assistance as liaison personnel between the official inspector, the food handler, and the management.

It is most important that regular contacts be maintained with state and federal food control officials and neighboring municipal food inspection personnel. Regular scheduled meetings should be planned, at which time experience during inspections, results of special investigations, new legislation, and new methods should be reviewed and discussed.

In obtaining corrections of undesirable conditions relating to food establishments, it has been found also that educational methods are by far the most effective way to obtain results. This method is one of the three mentioned by Rosenau,<sup>1</sup> "There are three ways of obtaining results, (1) through military or arbitrary ways; (2) through legislative or punitive ways; and (3) through the establishment by education of standards through group consciousness." Modern public health administrative efforts are apparently leaning toward the last method. This is as it should be. Modern police departments have adopted educational procedures as aids in enforcing certain laws and in crime prevention. The interest of a coöperative public can be capitalized to aid in effecting corrections of undesirable conditions that would be difficult to obtain by compulsion. Included in the coöperative public groups, of course, are members of the food industry. An educational procedure that has proved effective is the semi-regulatory one that combines regulatory action with education,

namely, that of health department hearings. At the conference or hearing, past and current findings during inspections are brought out, and instruction, advice, and warnings as needed are given to the individual or entire industry directed to appear for such conferences.

#### GROUPING OF FOOD ESTABLISHMENTS

For ease of assignment and inspection, it has been found by over ten years' experience that it is expedient to group food establishments located in a municipality into three classes: (1) wholesale, (2) manufacturing, and (3) retail. Food manufacturing establishments include bakeries, canneries, dairies, refineries, and other factories of this type. Warehouses, railroad terminals, wharves, cold storage plants, etc., comprise the wholesale establishments. Under retail establishments are included kitchens of schools, hospitals, homes for the aged and orphanages, retail markets, food stores, restaurants, hotels, and similar establishments. This grouping of food establishments creates a first, second, and third line of defense respectively against unwholesome food reaching the consumer.

#### ASSIGNMENTS FOR INSPECTIONS

It has been found in large municipalities that assignments for routine inspections by census tract subdivisions of the community result in more effective coverage of all retail food establishments. The use of census tracts as small units or as individual communities also aids in obtaining information concerning improvements in food establishment sanitation from year to year, and makes statistical analyses of results more profitable.

#### ESSENTIAL FORMS

A duplicate inspection record form has been found to be convenient\* and serves the threefold purpose of (1) pro-

\* Samples obtainable from the author.

viding a means of giving written instructions to the food establishment owner; (2) providing a permanent file record of the findings during inspection, eliminating the necessity of posting to a second form inspection findings; and (3) supplying the information on the copy for transfer to a punch card where desirable.

#### ALLIED ACTIVITIES

In addition to the basic duty of maintaining inspection of food establishments to prevent food illnesses, and to maintain them in a good sanitary condition, a food control bureau must necessarily engage in other activities. Filth in food should not be tolerated, regardless of the fact that it may be harmless. A project on this activity carried to completion is valuable in sensitizing the food industry against carelessness. Adulteration, misbranding, and mislabeling of foods must not be entirely overlooked, but when found it is more expedient to report these findings to state or federal agencies for action by those who are primarily responsible for this type of activity.

Food utensil washing and disinfection must be given consideration and should be a basic and continuous project. Each inspector should be trained to determine rinse water temperatures in dish washing machines, to test the strength of chlorine solutions, and to be able to swab food utensils without contamination of the swab. A compact food utensil swabbing bottle for this purpose has been described.<sup>8</sup>

Complaints pertaining to food or food handling methods must be investigated quickly and given immediate attention to be of value in correcting undesirable conditions in a community. While it is admitted that often only 10 per cent of the complaints are justified, these 10 per cent often lead to corrective measures being applied to all food establishments in the community.

Dual water supplies, cross-connections, inadequate ventilation and lighting, garbage and waste disposal, insect and rat eradication, occupational hazards among food handlers, reviewing plans for new plants and alterations to existing plants are other problems that must receive attention. In all of these additional activities no attempt should be made to operate without aid from other bureaus or divisions within the health department or in the state health agency. In the investigation of food poisoning outbreaks it has been found that a team of investigators consisting of a physician, usually the epidemiologist, a bacteriologist or chemist or both, and the food official, facilitates intelligent interpretation of findings and eliminates a great deal of unnecessary laboratory work. Preferably the physician connected with the health department should make the contact with the physician attending the ill persons; the food official or physician may obtain information from the individual cases and may secure all samples of food available and of body discharges. No sample is submitted for laboratory examination until the findings and facts are reviewed by all members of the team, and only the food or foods common to all of the persons made ill are submitted for bacteriological or chemical analyses.

In the investigation of dual water supplies and cross-connections a sanitary engineer should be consulted. In occupational hazards the occupational disease physician, if available in the health department, is called upon for aid. Ventilation, lighting, and garbage and waste disposal are types of problems which should be discussed with industrial hygiene or sanitation personnel of the department.

#### TRAINING OF PERSONNEL

Regardless of the basic training of the food establishment inspector, in-service



instruction is needed as a constant supplement. Chemists, bacteriologists, and sanitary engineers are scientifically trained for this type of position, yet in-service training must be continued during the entire period of actual duty. As an example, the science of nutrition must be taught to the basically trained food inspector. The fortification of milk and other foods has a certain popularity. It leads to advertising racketeering and therefore has not especially endeared itself to some public health officials. The newer findings in food sanitation must be taught and research problems, even in food inspection activities, should be planned and discussed as part of the in-service training.

#### SUMMARY

Food inspection in a municipality has developed into a comprehensive field, requiring knowledge of the causes of food poisoning and food infections and utilizing all of the sciences practised by public health officials in preventing these illnesses and in maintaining the food establishment in a clean condition. The corrective measures employed include educational methods in the main. The coöperation of all public health, industrial, and lay agencies is of importance in this educational procedure.

Economic aspects of food control, while desirable, should be given secondary consideration over those of more public health importance.

Record keeping should be simple; punch cards and sorting machines are recommended where the numbers of

records warrant. Assignments by census tracts should be made, keeping pace with the best health department practice. Personnel adequately trained in bacteriology, chemistry, and sanitary engineering only should be employed for food establishment inspections. In-service training must be continued regardless of the basic training of the employee.

In food establishment inspection, as in all public health work, the population of the community should be studied. Procedures that are to be employed to prevent food poisoning and undesirable conditions in food establishments should fit in with the temperament of the community. A health-conscious community will usually respond to educational methods sponsored by the health department. The procedures mentioned are those that can be adopted in a moderately large community or modified for smaller communities.

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# A Simplified Medium for Pathogenic Organisms

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THE recent advances in our knowledge of the nutritional requirements of bacteria have opened the possibility of simplifying the standard media at present in use in bacteriological laboratories. The obstacle in the path of such simplification is the fact that each of the more parasitic forms has specific requirements of its own, and consequently it is not easy to find an extract which will combine the accessory substances found both in meat extract and in serum.

This note reports our experience with a new medium, relatively simple in composition, easy to prepare and satisfying the requirements of some of the more fastidious organisms encountered in daily work. It is the by-product of studies now in progress on the growth accessory substances for *Streptococcus hemolyticus* and *Pneumococcus*.

The medium consists of the following ingredients:

## A. Peptone—Salt Solution

Peptone (Difco)	5.0 gm.
NaCl	5.0 "
Na <sub>2</sub> HPO <sub>4</sub> · 12H <sub>2</sub> O	2.5 "
KH <sub>2</sub> PO <sub>4</sub>	0.35 "
MgCl <sub>2</sub> · 6H <sub>2</sub> O	0.3 "
H <sub>2</sub> O	1,000 ml.

## B. Tomato Juice 40–60 ml.

Solution A is prepared in the usual way and autoclaved. If an agar medium is desired, 20 gm. of agar are dissolved in a portion of the water and added to the hot peptone salt solution before

autoclaving. To the sterile liquid or solid medium are added 4 to 6 per cent of a sterile extract of tomatoes (Solution B).

The tomato extract is prepared from fresh, washed tomatoes (preferably the variety used for juice) either by a juice press or by passing them through a meat grinder. The watery pulp is filtered through filter paper. The clear filtrate is neutralized to pH 7.0 (usually 6.0–7.0 ml. N/1 NaOH is required to 100 ml. of filtrate), and sterilized by steaming in the Arnold sterilizer or by filtering through a Seitz filter.

The original filtrate has a reaction of pH 4.2 and if left unneutralized can retain its activity for months. It is best, therefore, to sterilize it before neutralizing and to add the requisite amount of NaOH as and when required. Steaming in the Arnold or boiling for a few minutes does not reduce appreciably the activity of the extract; autoclaving, however, destroys a large part of the activity.

Tomato juice is fairly rich in accessory substances needed by bacteria, such as thiamin, riboflavin and nicotinamid, as well as in some other substances not yet identified. It has been used before as a source of growth accessory substance. Thjötta and Avery (1921) used it as a source of factor "V" for *Hemophilus influenzae*. Jenkins (1923) recommended its use for the cultivation of streptococci; the proposed medium

did not prove satisfactory presumably because the author autoclaved the extract and thus destroyed the major portion of the accessory substance. Kulp and White (1932) used it for growing lactobacilli by adding 40 per cent tomato juice to a peptonized-milk-peptone medium.

Our medium has many advantages over the standard medium used at present. It is very easy to prepare. There is considerable saving of time—since no clearing or filtering of the medium is necessary. It is much less expensive than meat extract or meat infusion media. And finally it is suitable for growing some organisms which do not grow readily on standard broth or agar. In addition to the easily cultivated colon-typhoid group of bacteria, *Brucella*, *Pasteurella*, *Lactobacillus*, *Streptococcus*, *Pneumococcus*, and *Corynebacterium*

*diphtheriae* give good growth on this medium.

Comparative growth tests made in the tomato medium and in standard laboratory broth or broth plus serum showed up to the advantage of the first. Tubes containing the same volume of nutrient solution were given equal small inoculations (0.1 ml.) from the same diluted saline suspension of bacteria prepared from a 24 hour agar-slant culture. After incubating for 20 or 40 hours, the respective tubes were centrifuged at high speed to obtain complete sedimentation, the sediments resuspended in 5.0 ml. saline and the relative density determined in the photoelectric colorimeter (Evelyn 1936). The results of one series of experiments are given in Table 1.

These figures show clearly that the proposed medium is not only superior

TABLE 1

*Relative Growth Densities of Various Organisms in Standard Broth, Serum-broth, and Tomato Juice Broth (T.J. Broth)*

Culture	Medium	Colorimeter Reading (100=No Growth)	
		20 hr. Growth	40 hr. Growth
1. <i>Streptococcus hemolyticus</i> H 7276	{Broth Broth + 10% serum T.J. broth	97 80 90	96 79 69
2. <i>Streptococcus hemolyticus</i> (Richards strain H. McIlwain)	{Broth Broth + serum T.J. broth	97 74 71	97 76 64
3. <i>Pneumococcus</i> H 6480	{Broth Broth + serum T.J. broth	96 71 77	93 83 35
4. <i>Corynebacterium diphtheriae</i> (gravis)	{Broth Broth + serum T.J. broth	89 85 85	60 48 43
5. <i>Pasteurella leptiseptica</i>	{Broth Broth + serum T.J. broth	.. .. ..	99 96 97
6. <i>Lactobacillus</i>	{Broth T.J. broth	72 46	.. ..
7. <i>Escherichia typhi</i>	{Broth T.J. broth	57 35	.. ..
8. <i>Shigella dysenteriae</i> (Shiga)	{Broth T.J. broth	72 49	.. ..
9. <i>Brucella abortus</i> I	{Broth T.J. broth	.. ..	96 78
10. <i>Brucella abortus</i> II	{Broth T.J. broth	.. ..	88 83

to the more expensive standard broth, but that it generally is as good as or better than broth containing 10 per cent serum. The results on solid media parallel those in fluid media but do not lend themselves to quantitative comparison.

The results given above are typical of those obtained with a large series of strains from different sources. Tests were also made with a variety of obligatory anaerobes. Growth in McIntosh anaerobic jars on the T.J. agar was as good as on 1.0 per cent glucose-blood agar, but was better than that on 1.0 per cent glucose-agar.

This medium has also proved satisfactory as a basis for a variety of special media:

1. Addition of 10 per cent blood gives an excellent medium for cultivating *Neisseria* and *Hemophilus*.

2. It is as good as Loeffler's medium for cultivating *Corynebacterium diphtheriae* from swabs. Tests made in our diagnostic laboratory with 100 routine swabs gave the same results as Loeffler medium, and because of its transparency the colonies on this medium can be more readily differentiated from those of other organisms. Toxin production appears to be as good as on other media, but no quantitative test has as yet been made.

3. The addition of minimal amounts of tellurite 0.03-0.04 per cent to this medium offers a satisfactory differential medium for the various sub-types of *Corynebacterium diphtheriae* as well as for the common diphtheroids. Xerosis and Hoffmanni are readily differentiated from true diphtheria organisms. After 48 hours mitis can be differentiated from gravis and intermediate, but the last two are not readily distinguished.

*Corynebacterium xerosis*, gives heavy growth, black colonies.

*Corynebacterium hoffmanni*, slight growth, colorless colonies.

*Corynebacterium diphtheriae* (gravis), medium sized greyish colonies with a dark center.

*Corynebacterium diphtheriae* (mitis), small colonies, black with only a slight greyish rim.

4. Both MacConkey and Kligler medium can be readily prepared with T.J. agar as a base.

#### SUMMARY

This note presents a new basic standard medium which has many advantages over the one at present in use in bacteriologic laboratories. It is a simpler medium, more easily prepared with considerable saving in time and materials. It supports growth of all common pathogenic bacteria as well as many of those having special requirements, such as the streptococci, pneumococci, diphtheria bacilli, and lactobacilli. The *Neisseriae* do not grow on this medium without the addition of blood.

This medium can also be used as a base for the common differential media: tellurite for diphtheria, the various typhoid media, etc.

This medium is at present in use in the army laboratories in Palestine, and in our own class work.

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# Recommended Qualifications for Public Health Nursing Personnel\*

1940-1945

SINCE the publication of "Minimum Qualifications for Those Appointed to Positions in Public Health Nursing" in 1936,<sup>†</sup> far-reaching developments have taken place that need to be considered in setting new goals for the next five years. The years 1935-1940 have seen the greatest expansion of public health nursing in its history, due in large part to the health provisions of the Social Security Act. Despite the pressing need for nurses to fill available public health nursing positions, there has been an increasing appreciation by administrators of the importance of appointing nurses specifically prepared for the public health nursing field. The Social Security Act has assisted in this trend by making provision for many nurses to get the needed preparation as well as requiring through a later amendment that appointments be made under a merit system of personnel administration.

The completion of the revised *Curriculum Guide for Schools of Nursing* by the National League of Nursing

Education in 1937 has given impetus to the enrichment of the undergraduate curriculum so that the nurse may be more adequately prepared to make her contribution to the health and social welfare of the community in whatever field she enters. However, since this requires a faculty prepared to assist in the integration of the health and social aspects of nursing throughout the curriculum, emphasis has been placed increasingly on the importance of faculty preparation in these areas by many schools. Also, it is apparent that the graduates from the schools which offer such an enriched curriculum, with a wide range of clinical experience including communicable and mental diseases, will be considered potentially the most promising for public health nursing service. The membership list of the Association of Collegiate Schools of Nursing and the National League of Nursing Education's list of accredited schools will be helpful in furnishing another basis for the selection of graduate nurses for public health nursing.

The growth of merit systems as a method of selecting personnel both in official and nonofficial agencies has made for greater understanding by agencies and by citizens of the need for specific requirements for the various positions in the field of public health nursing. The qualifications recommended here have been formulated in the light of these present trends in qualifications for public health nurses wherever they may be employed.

Determined effort to reduce further

\* Preliminary Report of the Subcommittee on the Educational Qualifications of Public Health Nurses of the Committee on Professional Education, American Public Health Association.

This Report has been approved by the Education Committee of the National Organization for Public Health Nursing and by the Committee on Professional Education of the A.P.H.A. It is published here to permit the members and Fellows of the Association to review it and to offer criticisms and suggestions prior to its further consideration.

This Report, like all other statements of the committee, on professional and technical qualifications in public health, is subject to periodic revision in order that it may be kept abreast of the best thought.

<sup>†</sup> Published in *Public Health Nursing*, March, 1936, page 172.

certain existing health problems, such as crippling in children, maternal and neonatal hazards, tuberculosis, and the venereal diseases, has made emphasis on special services in these areas necessary. Each of these is recognized as one part of the whole family health service, and, as such, is most adequately carried on by the field nurse who is responsible for all phases of the public health nursing program. The nurse, however, needs help from consultants who in addition to the necessary equipment as supervisors have had preparation in the special field in which they are engaged.

Mindful of these trends and realizing that the first principle underlying the improvement of service is the appointment of qualified personnel, the Education Committee of the National Organization for Public Health Nursing and the Committee on Professional Education of the American Public Health Association recommend these qualifications for those appointed to public health nursing positions as the goal for 1945. They are based on the principles: (1) that one of the most essential requisites in public health nursing is the ability to work effectively with people, (2) that the public health nurse must be a competent nurse with sound basic theoretical and clinical preparation in nursing and with an understanding of its social and health aspects, (3) that additional study, including supervised field experience, is essential to prepare the graduate nurse for the specific functions of public health nursing, (4) that continued in-service education including qualified supervision (see II, A of outline) is necessary to further the development of the nurse's potentialities for improved service to the individual family and community, which is the goal of all public health nursing.

#### PERSONAL FACTORS IMPORTANT

While the following qualifications may

seem to stress academic preparation and professional experience, personality remains a major factor in successful public health nursing service, and therefore must always be given due consideration. Also, good physical health as determined by a preemployment examination should be considered essential because without it the other qualifications are rendered less effective.

Improvement in the technic of personal interviews and the collection of credentials, through study of personnel methods in other fields, will help in developing more accurate methods for the selection of applicants with fundamental requisites. Tests and other measurements need to be studied as a means of determining individual abilities and capacities.

On the other hand, it is important for both the nurse and the employer to understand the purpose and value of theoretical preparation for public health nursing. University study should be an economical means to the end of greater competency in daily work and not an end in itself. It is a means for the nurse to review under guidance past and present practice in this field in order to become familiar with sound, workable principles and thereby avoid some of the trial-and-error learning common to all new workers. It is an opportunity to gain additional tools, both in content and method, which will make work in the field more pertinent and more productive.

Unusual competence in the work to which the nurse is assigned is the only sound basis for promotion to greater responsibility, and the one most frequently used. Well utilized graduate study should assist in the development of such competence. The amount of study suggested in these recommended qualifications is believed to represent the minimum needed for each type of worker described.

While these qualifications apply spe-

cifically to new appointees, the importance of corresponding additional preparation for those already appointed should receive careful consideration in relation to each nurse. Under certain conditions, it might be desirable for agencies to adopt a policy urging those appointed within the last few years to meet within a specified period of time the recommended theoretical preparation for the respective positions.

#### I. STAFF NURSES\*

*A. For the nurse working on the staff of an official or private agency under the direct supervision of a nurse supervisor who meets the qualifications herein set forth—*

Duties: To carry on the direct nursing service of the agency in the home, clinic, conference, school, or industry.

##### Preparation:

1. General education—High school graduation or its educational equivalent which meets college entrance requirements. Education on a college level is desirable.

2. Basic nursing education—Graduation from an accredited† school of nursing connected with a hospital having a daily average of 100 patients, with the necessary affiliation, which gives the nurse a broad clinical experience in medical nursing, including acute communicable disease, tuberculosis, and the venereal diseases: psychiatric and pediatric nursing (including the care of children with orthopedic and cardiac conditions); and an understanding of the social and health aspects of nursing, both physical and mental, through an integrated program of instruction in

classroom, ward, outpatient department, with appropriate use of community facilities.

3. State registration.

4. Postgraduate study—Completion of the year's program of study in public health nursing in a university program approved by the National Organization for Public Health Nursing, previous to or within five years after appointment.

*B. For the nurse in an official or private agency not working under direct supervision—*

Duties: In addition to carrying on the direct nursing service of the agency as in A, to assist in organizing the service; to work with lay and professional groups; to carry on the activities in special situations such as the school and industry.

##### Preparation:

1. General education—Same as listed for staff nurse under A.

2. Basic nursing education—Same as listed for staff nurse under A.

3. State registration.

4. Postgraduate study—Completion of the year's program of study in public health nursing in a university program approved by National Organization for Public Health Nursing, before appointment.

5. Experience—At least one year's experience under qualified nursing supervision in a public health nursing agency in which family health is emphasized.

#### II. SUPERVISORS AND EXECUTIVES

*A. For the supervisor—*

Duties: To supervise the staff nurses in an official or private agency and to assist in their growth and development; to plan and develop the nursing program for which she is responsible in relation to the total program of the agency; to correlate it with that of other agencies in the educational, social, and health fields; to study and evaluate the program within her own area.

\* See Minimum Qualifications for Nurses Appointed to School Nursing Positions. *Pub. Health Nurs.*, Feb., 1938, p. 169. Also Desirable Qualifications of Nurses Appointed to Public Health Nursing Positions in Industry. *Pub. Health Nurs.*, July, 1939, p. 410 and *A.J.P.H.*, 29, 7:789 (July), 1939.

† Accredited by the state board of nurse examiners.

**Preparation:**

1. General education—College degree.
2. Basic nursing education—Same as listed for staff nurse under I, A.
3. State registration.
4. Postgraduate study—Same as listed for staff nurse under I, B., and in addition, a course in principles of supervision.
5. Experience—At least two years' experience, one of which was under direct, qualified nursing supervision in a public health nursing service in which family health is emphasized.

**B. For the consultant—**

**Duties:** To assist in analyzing the needs and developing the service in the special field; to correlate this service with other services offered by the agency and with the programs of other agencies; to advise regarding policies, technics, and procedures in the special field; to participate in the supervisory and staff-education program of the agency in cooperation with the other supervisory personnel.

**Preparation:**

1. General education—College degree.
2. Basic nursing education—Same as listed for staff nurse under I, A.
3. State registration.
4. Postgraduate study—Same as listed for staff nurse under I, B., and in addition a course in principles of supervision and advanced preparation in the special field, including content in that field, courses in general education, and methods of making and using studies.
5. Experience—At least two years' experience, one of which was under direct, qualified nursing supervision in a public health nursing service in which family health is emphasized, and at least one year's experience as a generalized supervisor.

**C. For the educational director or instructor in public health nursing—****Duties:**

In public health nursing agencies—to plan and to direct the educational program for the new nurse, for the student, and for the staff as a whole, and to correlate and develop the resources of the agency and of related community services for teaching purposes.

In schools of nursing—to assist in directing, to correlate, and to participate in the efforts to give the undergraduate student the concept of the social and health aspects of nursing, both physical and mental, through an integrated program of instruction in classroom, ward, and outpatient department, with appropriate use of community facilities.

**Preparation:**

1. General education—College degree.
2. Basic nursing education—Same as listed for staff nurse under I, A.
3. State registration.
4. Postgraduate study—Same as listed for staff nurse under I, B., and in addition, courses in principles of supervision and in the philosophy and principles of education.
5. Experience—At least two years' experience, one of which was under direct, qualified nursing supervision in a public health nursing service in which family health was emphasized, and at least one year's experience as a supervisor in a public health nursing service.

**D. For the director—**

**Duties:** To administer the nursing service of the official or private agency; to determine with the administrative official or the board the policies and program to be followed; to interpret the needs of the nursing service to the administrative officials, to the board, to committees, and to the community; to participate in community planning and action in health and social welfare.

**Preparation:**

1. General education—College degree.
2. Basic nursing education—Same as listed for staff nurse under I, A.
3. State registration.



4. Postgraduate study—Same as listed for staff nurse under I, B., and in addition, courses in supervision and in principles of administration.

5. Experience—At least three years' experience, preferably in more than one type of agency—i.e., official and private—including experience in supervision.

*E. For the director of a university program of study—*

Duties: To assume direct responsibility for the planning and administration of the program.

Preparation:

1. General education—Graduate degree.

2. Basic nursing education—Same as listed for staff nurse under I, A.

3. State registration.

4. Postgraduate study—Completion of the year's postgraduate program of study in public health nursing in one of the university programs approved by the National Organization for Public Health Nursing, before appointment, and advanced university courses in general education and in supervision and administration in public health nursing.

5. Experience—A minimum of five years' public health nursing experience, preferably in more than one agency,

one year of which should have been in a general public health nursing agency with direct, qualified supervision, emphasizing family health. This experience should include experience as a staff nurse and experience as a supervisor, executive, or educational director.

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# Public Health Activities Against Tuberculosis in Mexico\*

VICTOR FERNÁNDEZ MANERO, M.D.

*Chief of the Federal Department of Health in Mexico, Mexico City*

WITH its wide variety of living conditions due to altitude, variations in rainfall and other conditions governing agriculture and industries, Mexico has a broad range of tuberculosis rates. The problem can best be

does not greatly exceed the number of deaths for the same period.

TABLE 1

## *Tuberculosis Mortality in Mexico*

Years	Pulmonary	All Forms
1922	68.23	78.83
1923	27.34	76.06
1924	59.30	68.70
1925	66.28	74.67
1926	58.84	67.22
1927	60.21	66.34
1928	60.80	67.01
1929	61.02	67.67
1930	61.42	68.71
1931	61.82	70.03
1932	74.84	65.72
1933	55.16	61.66
1934	38.16	52.68
1935	39.13	54.27
1936	39.37	54.08
1937	39.36	54.09
1938	.....	55.38

evaluated by a study of the death rates of the country as a whole and of the individual states. In general, the high rates are found along the coast of Mexico and along the northern border, while lower rates are the rule in mountain states. Death rates are higher in the large cities than in the smaller towns, with the exception that mining districts often present higher rates than the agricultural regions around them.

Little can be learned from a study of morbidity as yet, for even in the capital the number of reported cases

\* Read before the Health Officers Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 16, 1941.

TABLE 2

## *Tuberculosis Mortality in the Federal District*

Years	No. of Cases Registered	Deaths	Death Rate Per 100,000
1934	1,036	1,301	88.11
1935	1,082	1,345	87.89
1936	1,801	1,312	82.73
1937	2,236	1,370	83.36
1938	1,868	1,417	83.19
1939	1,647	1,473	83.44

Some information is contributed by surveys with the use of tuberculin to determine the number of sensitive individuals. The greatest number of these tests has been made in children up to the age of 14 years, using the von Pirquet technic. Three such surveys gave the following results: one of nearly 20,000 school children, one of 4,224, and another of 861 children, all in Mexico City, gave the same percentage of positives, 52 per cent. Results for specific ages are not available. In another series, 14,131 children attending child hygiene centers in Mexico City were tested with the results shown in Table 3.

Of the children with positive von Pirquet who were subsequently exam-

TABLE 3

## *Tuberculin Test (von Pirquet) in Infants*

Age-Years	No. of Infants Tested	Per cent Positive
0-1	11,036	1.6
1-2	2,087	4.6
2-3	164	11.0
3-4	283	14.8
4-5	297	17.8
5-6	239	15.6
6-7	25	20.0

ined by x-ray, 0.4 per cent were found to have active tuberculosis.

Measurements of sensitivity to tuberculin have been made on a limited scale, and they show something of the prevalence of infection with tuberculosis in the capitals of five states, Veracruz, Morelos, Hidalgo, Mexico, and Michoacán, in all of which tests were made with the same technic. A single injection of 0.1 of a 1 to 10,000 dilution of old tuberculin prepared by the National Institute of Hygiene was injected intradermally, and readings were made 48 hours later.

The percentage of positives obtained varied in the age group 5-9 years from 17 per cent in Toluca and Morelia to 28 per cent in Pachuca; in the adolescent group, ages 10-14 years, from 28 per cent in Morelia to 41 per cent in Pachuca; in the young adults, ages 15-29, from 36 per cent in Morelia to 60 per cent in Jalapa; and in the age group 30 years or more from 59 per cent in Morelia to 97 per cent in Jalapa. The numbers examined in these age groups were: in Pachuca 4,264, in Morelia 2,418, in Cuernavaca 366, in Toluca 423, and in Jalapa 622.

Studies of the mortality rates and the scattered tuberculin test indicate that two features which are commonly found in other countries are true of the tuberculosis problem in Mexico; the age group most affected is that of young adults, from 15 to 30 years; and peasants who move to the crowded cities apparently show a greater susceptibility to tuberculosis than those born in the city environment.

These data give a rough sketch of the present tuberculosis problem. Speculation with reference to the causes of low mortality in certain regions and high mortality in other regions may well be postponed until more epidemiologic information is available. In the meantime we shall discuss the steps which have been taken in the past to

attack the problem and the recent developments which are intended to provide us with additional knowledge and additional facilities for the control of the disease.

Organized efforts for the reduction of the incidence of tuberculosis have been in operation for about 10 years. The leadership of the agencies involved has been, during the entire time, in the hands of the Division of Tuberculosis of the Federal Department of Health. Responsibility has been shared with the Departments of Public Welfare and Education. In addition, private initiative is represented by a National Tuberculosis Committee. Coördination between governmental and private agencies is assured by the position of the Federal Director of Health as ex officio President of the National Tuberculosis Committee. Yet this committee is autonomous and has its own Board of Trustees, its Bureau of Technical Advisers, its Information and Propaganda Bureau and its Finance Committee, and it has complete responsibility for the handling of its own funds.

The earlier years were devoted to developing the internal organization of the governmental entities associated in the work, to the establishment of the first dispensaries and hospitals, and to the development of clinical methods which would be most effective for large scale operations. During those years the National Tuberculosis Committee was relatively inactive. With the beginning of 1941, the time appeared ripe for the public to take a more direct part in financing anti-tuberculosis activities and there was inaugurated an active campaign which has brought subscriptions of nearly 4,000,000 pesos for the construction of new institutions. The committee recognizes the uncertainty which is associated with occasional drives to obtain financial support, so it is now studying means for obtaining a more regular income with

general participation of all social groups. It has under consideration stamp sales and also a plan for general insurance with special reference to tuberculosis.

The facilities already available for handling cases of tuberculosis include about 1,000 beds in public hospitals, and 100 in private institutions. There are 8 dispensaries for ambulant cases in Mexico City and 25 in the remainder of the Republic. There is also in operation a preventorium of 50 beds maintained by the Federal Department of Education in one of the suburbs of the capital. For a more indirect attack on the problem, systematic educational work is being done by the Department of Public Health in coöperation with the Federal Department of Education. The Department of Labor is taking measures to improve working conditions in industrial districts. The department of Agriculture is encouraging the development of family gardens and the use of more adequate diets in rural territory. The Department of Public Welfare is taking measures to improve the diet of the city residents, including the establishment of large low cost restaurants under the supervision of trained technical personnel. The National Committee on Housing and other organizations are fighting overcrowding and other unhygienic features of home construction. There are other institutions which have great potential value in the fight against tuberculosis and are now ready for mobilization in the attack. Among these are 289 centers of hygiene and health units with 443 physicians and approximately 1,500 nurses and also the coöperative medical groups organized by the Department of Health among small farmers. There are 121 of these groups, with 170 physicians, 10 dentists, and 225 nurses. For case finding and follow-up work in the homes, these groups will be of the greatest value when there

are more adequate facilities for treatment. Naturally the work which these groups are doing now against malaria and hookworm disease and in their efforts to improve environmental sanitation will be of great help as adjuncts to the direct efforts against tuberculosis. Public health expenditures in the Republic as a whole have increased in 10 years from \$0.08 Mex. to \$0.34 per capita for the Republic as a whole.

These are the means with which we expect to work in fighting this scourge in Mexico. Thus far, the actual clinical work has been hard, for the inadequate number of hospital beds has made it necessary to increase the turnover per bed to its maximum. Therefore, the 220 beds in the principal tuberculosis hospital have been used chiefly for surgical treatment, of which the volume is larger per bed than that in similar hospitals elsewhere. The dispensaries have been used for pneumothorax treatment of ambulant cases, and tuberculosis wards in general hospitals for the isolation of advanced cases in their terminal stages. This policy has emphasized the protection of the family by isolating the patient or by rendering his sputum negative, but of necessity it has omitted the provision of long periods of rest for many patients who might have benefited.

Because our campaign is in its early stages, and the public is not yet prepared to take full advantage of it, our clinicians have severe handicaps. Sixty-eight per cent of the patients when first reported show bilateral lesions; 50 per cent show cavities, and nearly 12 per cent present cavities in both lungs. Under such conditions extreme care is necessary in the selection of cases for surgery, and effective use of hospital beds by skillful technic and good judgment is essential.

The Federal Department of Health and the National Tuberculosis Committee feel that the period of develop-

ment of methods and of preliminary organization has been sufficiently extensive and, working together, they are now trying to develop to full capacity all of the resources which are available for their fight against this plague. The program for this year and those immediately following is to be devoted to the building of more hospitals and a rehabilitation farm in the Federal District, with an additional sanatorium for each of our coastal regions, at a total cost of about 5,000,000 pesos.

The program will increase the number of available beds by about 1,700, all of them devoted exclusively to the care of patients suffering from tuberculosis.

This is the situation of Mexico, so far as tuberculosis is concerned, and upon these plans we base our hopes for a better country and a healthier and happier people, your neighbor, your brother in ideals, in creeds and in thought, for a united and civilized American Continent.

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## THE BROAD VISIONED LAYMAN AS AN AID IN PLANNING

PERHAPS one of the shrewdest observers and interpreters of current events and affairs is Mr. Raymond Clapper, the columnist. Though occasionally he builds a fire under the near great or even the great, usually he writes in a restrained manner, free of the omniscience and cocksureness to which many columnists are addicted. In connection with the war effort in general, and in particular relation to production, he made this comment in the June second issue of the *New York World-Telegram*, "The expert again has been caught with his nose so deep down in the details and in traditional ways of operation that he missed the possibilities. Experts are indispensable. They are the fellows who get the job done. But sometimes it has to be started by the outsider who is just too ignorant to know about all of the difficulties. He hasn't sense enough to know there is a limit to what can be done, and, sure enough, time and again he turns out to have been nearer right than the men who knew all about it."

One cannot but agree that this observation is sound as regards plans for expansion of public health work after the war. Those who are in the thick of public health activities are rated experts and possibly, as such, are inclined to resent comments and suggestions from outsiders. But an inevitable cost for expertness is to be found in a lack of perspective, particularly as this perspective relates to broader issues. The expert is so occupied in the precise measuring or routine felling of individual trees that the direction of the prevailing wind and the position and significance of the woods in question are likely to go unobserved. In contrast, it is not an uncommon experience of health experts, in dealing with those whom they consider laymen, to obtain now and then some shrewd observation, apparently quite naïve in its inception, which disposes of a great writhing mass of questions for which the experts could find no common answer. In similar situations, too, one hears from time to time lay suggestions which, because of simplicity and boldness, we in public health would never have considered as a possible course of action. Now two things may be done in such circumstances. One might exhibit the tired tolerance of the professional for the amateur, and

indicate that fools may ask questions beyond the ability of the wise to answer; or due consideration may be given to each such suggestion which carries merit, regardless of its source and, most of all, regardless of its orthodoxy.

Not only do we recommend the latter course, but further we urge on public health experts the discussion of their post-war plans, large or small, with intelligent laymen who in their own fields have encountered problems generically the same. Obviously, the lawyer would not know much about viruses or vitamins, but in applied psychology he could give most professionals all the aces in the deck and beat them hands down. At the other end of the scale are those in the exact sciences, who generally know things rather than people. Behind them is such a rigid discipline of training, and in their daily work they must exhibit such an exactness of thought, that their basic-principle ideas may safely and productively carry over into fields outside their immediate specialties. Similar observations might be made on benefits to be derived from conference with the historian, the educator, the industrialist, the labor leader, the plain businessman; and if one in health work wants really to feel the public pulse and see his problems and plans as others see them, let him talk with the taxi driver, the tenant farmer, the man with the shovel, the butcher's boy.

We need these associations in our planning for the future. Naturally, from them would come many crack-pot suggestions. Sheer ignorance and stupidity would occasionally give rise to puerile observations, and prejudices would not infrequently color the advice that one got. Nevertheless there would be much that is worth while if one chose his consultants wisely, and the fresh viewpoints and unfettered suggestions thus obtained would stimulate the expert to strike out for far horizons. A good mind is worth exploring, regardless of whether that mind is in the skull of a banker, a businessman, or even a politician.

## THE NEED FOR CONTINUING STUDY

NO inconsiderable part of the scholar's armamentarium is the knowledge of where to look for information, and the availability of texts, monographs, journals, reprints, etc., when wanted. For one whose work is in a university or a large health department with library facilities, this matter of getting information is made amazingly easy. Discussions with his associates, with visiting colleagues, an abundant supply of periodicals, shelves of rich source materials, current indices, and even bibliographic and abstract service make reception of current and past knowledge easier than remaining uninformed.

One who lives in such circumstances, therefore, likely to forget the plight of those laboring on the far frontier of public health work: the medical officers of health, the public health nurses, the engineers, and others on the staffs of rural health departments. Seldom do these people have the stimulating experience of visitors and, outside of their immediate staff associates, there are not locally any others in their respective professions who are engaged in public health work. Their reading material, with few exceptions, is limited to such books and professional journals as they might be able to pay for from their own slim salaries. Their departmental budgets for their programs with skin-tightness, and there is no slack for purchase of reference texts or periodicals. Even when at the end of the year there is some unlooked for balance in the contingent or miscellaneous fund, the

local agency lacks authority to spend it for such a luxurious purpose as books—or is too hard pressed by some other need even to consider an expenditure for this purpose.

We know too much of the rural budget and of state and local problems to visualize or advocate a library in each small health department. Yet we know, too, that continuing study and current reading is an acute need of those who work, unsung, in difficult circumstances. And we feel that the situation is worse than it need be. It is deficient not because of any opposition to it by those higher up, but rather because there has been a tendency to overlook it under the necessity of meeting demand services. In all fairness, too, it must be said that some state health departments are trying to overcome the situation through news letters, a central lending library, institutes, and regional conferences. These measures help, but after all they do not serve the same purpose as readily available books and regularly received journals. Would it be stretching too far the definitions of "equipment" or "supplies" or "upkeep" to consider books and journals as coming under one of these budgetary headings? In the end it is just as important, possibly even more important, to feed the minds of the staff as it is to get furniture for the office, provide coal for the furnace, or repaint the front door.

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## WHAT AND WHO IS AN EPIDEMIOLOGIST?

*Comments on an editorial published in the April, 1942, issue of the JOURNAL:*

From Ralph E. Wheeler, M.D., of Vanderbilt University Medical School, comes this comment:

"Like his prototype, the clinician, the epidemiologist (the 'Doctor' of actually or potentially sick *groups of human beings*) is an observer with many strings to his bow. First of all he is clinician enough to be able to identify ailments by making and evaluating observations in a wide variety of fields—history, physical and laboratory—as they apply to the individual. If he can't actually make these observations he at least knows enough about making them so that he can 'ride herd' upon those who do. Second, he is statistical analyst enough to use statistics where their use is indicated in the collective field: primarily to find groups maximally at risk. The rate, commonly used to express this risk, is not a bad shibboleth by which to test the genuine-

ness of one who calls himself an epidemiologist. If he quibbles mightily over the numerator and grabs up anything that offers for a denominator, he is really a clinician at heart. If he accepts anything that offers—be it only reported cases—for the numerator and bickers endlessly over the denominator he is probably a biostatistician. If he frets indefinitely over both numerator and denominator he is more likely to be an epidemiologist. It is not possible to say that individuals in this latter category *are* epidemiologists because clinical and statistical ability are but two of the necessary qualifications. With these two skills alone one can merely explore ways of transmission (or risk) of manifest illness in gross categories. Finer categories of susceptibility are available through the laboratory where confirmatory evidence on suspected modes of transmission and *sources* may



also be identified. Nor can the word 'laboratory' be construed too narrowly: bacteriology, chemistry, parasitology, and physics contribute their share.

"Beside having clinical, statistical and various laboratory facets the epidemiologist is a basic observer in other fields—at least trained and experienced—in sanitation and sociology. General

biology and geology as hobbies suddenly loom large as professional aptitudes at times.

"In the broad warfare on disease, the epidemiologist leads task forces against particular objectives. He adapts his forces to the nature of the objective. To get the most out of each weapon at his disposal, he should have had both training and experience in its use."

M. J. Rosenau, M.D., of the School of Public Health, University of North Carolina, has this to say:

"An epidemiologist is a disease detective. This definition would not suit an historical epidemiologist, and on the other hand a statistical epidemiologist would have difficulty in fitting a curve to any definition supplied by an experi-

mental epidemiologist. An applied epidemiologist who looks practical realities in the face would consider any definition of the other kinds of epidemiologists as a description rather than as a definition. Anyhow, a shoelather epidemiologist would have no quarrel with Dr. Watson if he called him a disease detective."

C.-E. A. Winslow, Dr.P.H., Professor of Public Health, Yale University School of Medicine, contributes the following comment:

"The question raised by your editorial 'What and Who Is an Epidemiologist?' can, I think, only be answered in rather broad terms. I think anyone may claim this title who is either advancing or applying knowledge in relation to the causation and control of herd diseases (not necessarily limited to those of microbic origin). There are at least three major lines along which knowledge of this kind may be developed; statistical epidemiology, clinical case studies (as developed by Opie and Paul), and experimental epidemiology—just as in chemistry we

may have physical chemists and physiological chemists. Except in the field of experimental epidemiology we must include both those who contribute to basic scientific knowledge, and those who apply such knowledge in the field of health department practice. A scholar who analyzes the history of epidemiological thinking certainly deserves a place in the scheme, and so does the health official working in the field of communicable disease control—at least if his applications are made on the basis of the best available fundamental knowledge. In the area of either theory or practice he should have special training, but we cannot exclude those who have obtained this training by the road of arduous experience."

## BOOKS AND REPORTS

Four Treatises of Theophrastus von Hohenheim Called Paracelsus—Translated from the original German, with introductory Essays by C. Lilian Temkin, George Rosen, Gregory Zilboorg, Henry E. Sigerist—Edited, with a preface, by Henry E. Sigerist. Baltimore: Johns Hopkins Press, 1941. 256 pp. Price, \$3.00.

One of the most influential nonconformists in science was the Swiss physician Paracelsus (1493–1541). His bitter opposition to the then current orthodox medical canon had little influence at his time. His ideas, however, powerfully assisted in 16th and 17th century application of chemistry to medical practice. His semi-mystical speculation made him a hero to many 19th century Romantics.

Dr. Temkin's translation of the *Sieben Defensionen* offers an excellent personal picture of Paracelsus and his ideas. Dr. George Rosen's translation of *Von der Bergsucht und andern Bergkrankheiten drei Bücher* is a significant interpretation of the first important treatise on occupational diseases. From his personal experiences, Paracelsus had direct acquaintance with miners' diseases and his observations constitute the origin of industrial medicine and hygiene. Paracelsus realized the importance of what we would now term "public health measures." Unfortunately he seemed to have no practical suggestions for preventing the conditions he described so well.

Another pioneering work of Paracelsus in his *Von den Krankheiten, so die Vernunft berauben*, translated here by the psychiatry historian, Dr. Gregory Zilboorg. This deals with mental disorders and in many ways seems to anticipate modern views. Contrary as usual to the then customary belief,

Paracelsus approached mental disorder in a rationalistic manner, relatively free from demonism, and based on his own experiences. He appreciated the significance of unconscious and sexual factors in mental disorder, and otherwise showed many manifestations of modern psychiatry trends.

Dr. Sigerist translates the poetic *Liber de nymphis, sylphis, pygmacis et salamandris et de cacteris spiritibus*. This is one of the most artistic, and philosophical of the writings of Paracelsus, but also one of the most difficult to appraise.

For the practical public health worker of today, the treatises *On the Miners' Sickness* and *On Diseases that Deprive Man of His Reason* are the contributions of Paracelsus most likely to hold interest. Dr. Sigerist and his associates deserve appreciative congratulations on issuing this important historical study at this time. CHAUNCEY D. LEAKE

Doctors Anonymous—*The Story of Laboratory Medicine*—By William McKee German, M.D. New York: Duell, Sloan and Pearce, 1941. 300 pp. Price, \$2.75.

In this book the author makes a convincing plea for the recognition of the pathologist, who, he says, is "the unknown man of medicine," yet much of the diagnosis of disease and a great deal of the treatment are based on his discoveries and findings. He has no desire to exalt the pathologist unduly since no one specialty in medicine is greater than the others, all parts functioning together for a real scientific life. A history of the past 50 years, which covers pretty well the time since modern pathology had its birth, is particularly good reading, informative, and dramatic.

Every physician knows the value of

the post-mortem and is aware of the many superstitions which existed and blunders made before study of disease in the cadaver was allowable. Every honest physician knows of blunders in diagnosis which could have been avoided by bacteriological and pathological tests.

In surgery the frozen section done on the spot often determines the extent and character of the operation. The many facts brought forward in the numerous case histories cited are convincing arguments for the greater recognition of the part played by the pathologist in the everyday practice of medicine. This was recognized by the American Medical Association and the American Society of Clinical Pathologists; so in 1936 the American Board of Pathology was incorporated with authority to issue certificates of proficiency in the special field of pathology to those meeting the required standards.

In spite of what we know, a recent survey, 1939, shows that there are only 4,673 departments of pathology in the 6,166 approved hospitals, and these were directed by only 3,601 medical graduates, the conclusion being that only about one-fifth of these men have qualifications equal to those required for certification by the American Board of Pathology.

The pathologist is important from other standpoints. Too many cases of murder—poisoning, for example—have gotten by through lack of proper examination by a trained man—"Crime without punishment." The author takes a well deserved slap at what he calls "coroner's thrombosis," a diagnosis made from superficial examination.

The book is also of necessity more or less a study of human nature as discussed under "Fads, Fashions and Disease." A slap is also made at medical ethics which too often interfere with the correction of blunders. The author asks "ethics or diagnostics?"

Though the book is evidently intended

for the public, the doctor is not neglected. It is pleasantly written and, with the exception of one chapter, can be understood by the public. Modern medicine is likened to a tree—the trunk and branches suggest clinical medicine; the roots, invisible below the soil, are the science of the laboratory. They all go, however, to the formation of the same living, growing thing.

The book can be commended without hesitation. The printing and make-up are excellent. The author has fallen in with the fad of having an introduction by a popular writer. Once again let us impress on the writing public that "Good wine needs no bush."

MAZŸCK P. RAVENEL

**Industrial Waste Treatment Practice**—By E. F. Eldridge. New York: McGraw-Hill, 1942. 401 pp. Price, \$5.00.

This book is based on industrial waste data collected by the author as research associate of the Engineering Experiment Station at Michigan State College. Some of the material was originally published in 1938 in *Bulletin* 82 of the Station. The book greatly enlarges and revises the data in this bulletin and brings between two covers the most complete and authoritative discussion of industrial wastes published. For some years there has been need for just such a volume as this—one that will serve as a guide to engineers and plant operators faced with industrial waste problems.

The book devotes a chapter to each industry in the United States contributing troublesome industrial wastes. These include wastes from beet sugar, milk, canneries, tanning processes, pulp and paper mills, textile mills, meat and slaughter houses, laundries, metal industries, gas and coke manufacturing, fermentation wastes and oil. In each chapter the manufacturing processes are described, the composition of the waste

materials given, and treatment processes and sludge disposal methods discussed. That the author has done well with his subject is well exemplified in his handling of the complicated and varied processes in textile manufacturing.

The value of the book is enhanced by chapters on the industrial waste problem, general stream pollution theory, the characteristics of industrial wastes, standard methods, structures and equipment employed in general sewage treatment practice, the laboratory analysis of industrial wastes, and a chapter on the treatment of domestic sewage when combined with industrial wastes. This last chapter is one of the most useful in the book and might profitably be enlarged in the next edition.

Analytical procedures for biochemical oxygen demand, suspended solids, acids and iron in pickling liquors, chlorine demand, cyanide, phenol, oil and grease as found in industrial wastes are included in a separate chapter. Emphasis is placed on determinations of biochemical oxygen demand and suspended solids as being of the most significance in indicating the strength of industrial wastes. The need of diluting many industrial wastes before determining the suspended solids by the Gooch crucible method is mentioned, and the steps to be followed are given. It would seem that the substitution of the Buchner funnel for the Gooch crucible might be an alternative.

The explanation of E. B. Mallory's activated sludge theory in the chapter on methods of sewage treatment is the clearest published and it will surprise the reader to find it in such detail in a book on industrial wastes.

The author quotes J. K. Hoskins as concluding that the organic pollution contributed by industry is about equal to that contributed by the entire population. Eventually industry will be required to go as far with waste treatment as has been expected of municipalities

in the treatment of sewage. The book in outlining the methods of industrial waste treatment now available is a valuable contribution to the sanitary engineering field.

LEROY W. VAN KLEECK

*The Golden Jubilee of the Association of Military Surgeons of the United States—A History of Its First Half Century, 1891–1941—By Edgar Erskine Hume, Colonel, Medical Corps, United States Army. Washington: Association of Military Surgeons, 1941. 371 pp. Price, \$2.00.*

Under the leadership of Dr. Nicholas Senn, a brilliant surgeon of Chicago and a prominent Surgeon in the National Guard, the Association of Military Surgeons of the United States was founded in Chicago during September, 1891. Those participating in the founding were National Guard Surgeons from several states. In this volume the author presents an interesting history of the association.

The Association of Military Surgeons of the United States has played an important part in developing and maintaining interest in medical military preparedness among the medical profession in this country during the past half-century. This is a worth while contribution for military medicine is a distinct specialty. Physicians and dentists, however thoroughly grounded in their professional work, must receive special training in order to fit them for service with the military and naval forces.

This history, dealing with the first 50 years of the work of the association, presents a complete, chronological account of the founding, the annual meetings, and the other events of importance in the affairs of the organization. Photographic cuts of all the presidents, editors, as well as facsimiles of documents and title pages of historical interest are included. The official journal of the association has been published

under one title or another since the founding of the association in 1891. The present name, "The Military Surgeon," has been used since 1901.

Colonel Edgar Erskine Hume, a distinguished officer of the Medical Corps of the Regular Army, the author of this history, is unusually well qualified to serve as a historian for the association. He has been a member of the organization for some 25 years. During about half of that time he has held office or served on the Executive Council. He has attended 20 of the 47 annual meetings, and has been personally acquainted with a majority of the men who have held office in the association. Colonel Hume has also represented the association at several international meetings of military surgeons held abroad and in the United States.

This is a valuable handbook where may be found in readable and compact form the essential facts relating to the Association of Military Surgeons.

R. C. WILLIAMS

**Fatigue of Workers, Its Relation to Industrial Production**—By the *Committee on Work in Industry of the National Research Council*. New York: Reinhold, 1941. 165 pp. Price, \$2.50.

This book is a report of the hearings of the above committee summarized and presented in an interesting manner by George C. Homans. The title of the report is misleading since it does not deal with fatigue, as usually implied by this term, but with the psychological and sociological factors which control the output of industrial employees and their attitude to work and management.

The first section, which is quite unrelated to the remainder of the book, presents briefly the experimental studies of Dill and McFarlane on the effects of heat and high altitude. In the next section, clinical psychoneurotic conditions which may result from industrial

maladjustments are illustrated in three cases studied by Dr. Canby Robinson.

The greater part of the report is devoted to studies, made by the Western Electric Company, of a selected group of employees over a period of years. The output of the workers was shown to be far less affected by the physical environment, hours of work, etc., than by psychological factors and the social conditions of work. The studies emphasized the need of workers to self-expression which resulted in the formation of informal organizations by the employees. These controlled their output, behavior, etc. The personal interview and other methods used by the Western Electric Company to produce a closer association between management and employees are discussed.

Labor's viewpoint on self-expression and labor unions is represented by Harold Ruttenberg. Problems involved in setting output standards and time allowances for tasks are discussed by Dr. Jacob Blair. The final section is a review of Chester Barnard's book *The Functions of the Executive*.

This report is very timely since it presents scientifically the fundamental problems which control industrial relations and output. ANNA M. BAETJER

**Stedman's Shorter Medical Dictionary**—By Thomas L. Stedman. Chicago: American Publishers Association, 1942. 277 pp. Price, \$2.50.

A "completely revised and enlarged" edition of this widely circulated dictionary should be as useful for most purposes as the unabridged edition. However, it is regrettable that the information on the acute communicable diseases apparently has not been brought up to date since the death of Dr. Stedman and should certainly be brought into conformity with the official report of the American Public Health Association.

REGINALD M. ATWATER

Heating, Ventilating, Air Conditioning Guide (20th ed.)—*New York: American Society of Heating and Ventilating Engineers*, 1942. 1,136 pp. Price, \$5.00.

This volume presents, in accordance with its established policy, the latest authoritative information of value to heating, ventilating, and air conditioning engineers. Many changes have been made in the text material; new material where such was available has been added; and a new chapter on fundamentals of heat transfer has been included. As before, the volume is divided into several sections dealing, in general, with types of heating, cooling, and air conditioning systems and their control, as well as the fundamental thermodynamic principles and their application to this field. Numerous examples are given illustrating methods of computation, and, as in previous editions, there is included a Manufacturers' Catalog Data Section describing available equipment. C. P. STRAUB

Proceedings and Papers of the Twelfth Annual Conference of the California Mosquito Control Association—*Notes and Transcription by Margaret A. Prefontaine, Edited by Harold Farnsworth Gray. Richard F. Peters, Secretary-Treasurer, 3093 Life Sciences Building, Berkeley, California*, 1941. 143 pp. (with notes on the identification of California mosquitoes by William C. Reeves). Price, \$1.00.

The proceedings of the Conference were divided, in effect, into four symposia; namely, encephalitis in California, mosquito control in relation to national defense, new information on the entomology of mosquitoes, and mosquito control operations in California. Only the symposium on encephalitis lends itself to review, and its three interesting papers should be read in the original.

Serological surveys indicate the es-

tablishment and coexistence of western equine and St. Louis virus in rural, agricultural sections of the central valley of California where the encephalitides they cause are endemic, as well as in supposedly non-endemic (coastal) areas and Yakima Valley in Washington. Evidently the St. Louis virus has been present for some time and not recently imported as supposed formerly. Antibodies for the western type virus predominate in humans, horses, domestic fowls, and wild rodents, but antibodies for both types are found frequently in the same animal, particularly in horses.

There is a definite seasonal prevalence of encephalitis in horses and man, with the peak of incidence being reached in late summer and the peak for horses usually preceding that for man. Evidence is presented that transmission is probably from domestic animals to a biting insect to man. While ticks (*Dermacentor andersoni*) and the cone-nosed bug (*Triatoma sanguisuga*) may be natural vectors of western virus, it is probable that mosquitoes are the principal vectors. Mosquitoes of the genus *Aedes* can transmit western equine virus and *Culex tarsalis* have been found infected naturally with both western and St. Louis viruses. Epidemiological evidence apparently incriminates the latter mosquito. There may be more than one mosquito vector, and possibly special vectors from animal to man and from animal to animal. However, the transfer of viruses in nasal secretions has not yet been ruled out.

ROBERT BRIGGS WATSON

Food and Drug Regulations—*By Stephen Wilson. Washington: American Council on Public Affairs (2153 Florida Ave.)*, 1942. 177 pp. Price, \$3.25 (cloth); \$2.50 (paper).

From the opening statement of the introduction by Professor W. H. Hamilton to the last sentence of the final

chapter, this book is replete with important facts, incidents, and excerpts of debates leading up to and through the passing of both Federal Food and Drug Acts of 1906 and 1938. One chapter is devoted to the history of food and drug legislation from the days of the Athenians and Romans to the passage of the Pure Food and Drug Act of 1906. Then follow three chapters of the history of this latter Act, its difficulty in administration, and its weaknesses. The campaign for a new federal food, drug and cosmetic law with its ultimate passage in 1938 and its causes and consequences are discussed in the last three chapters.

This book should be obtained by every food and drug control official because it is a complete story of food and drug legislation of the federal government. There are practically no errors in printing, the type is clear and easily readable, and there are many references.

No mention however, is made of state and local food and drug legislation. The title of the book, therefore, could very well be, "Federal Food and Drug Regulations." FERDINAND A. KORFF

**Superior Children through Modern Nutrition—***By I. Newton Kugel-mass, M.D. New York: Dutton, 1942. 332 pp. Price, \$3.50.*

In this book intended for laymen, the author strives for erudition. For example, among the vitamins he lists vitamins I, J, L, M, P, T, U, and W, attributing to some of them an importance in human nutrition not yet proved.

His data vary each time he quotes figures. The vitamin A content of a quart of milk is given on page 29 as 150 units, whereas on page 34 a pint of milk is stated to yield 1,000 units; in the table on page 37 one "serving" of milk contains 720 units, while in the table on page 317 one serving con-

tains 570 units. The book contains many similarly careless statements.

Such pseudoscientific pronouncements as the following are unacceptable. "Does nursing sap a mother's strength? . . . Since breast milk is derived from nutrients in the mother's blood there is no depletion of strength, but only extra utilization of her daily diet" (page 122). "When a solid food is offered for the first time and the infant refuses or vomits it, the probability is that his organism is allergic to this food and unable to utilize it properly" (page 222). "Without the right start during the formative months of fetal life, a lifetime of nutritional devotion to the cause of good teeth will not correct this maternal mistake" (page 95). "In fact the child on an ordinary diet only develops his optimal quota of brain well after the sixth year. If breast fed his intelligence quotient is apt to be higher than if artificially fed because breast milk contains 100 per cent more galactose than cow's milk" (page 89).

Undue stress is placed on the prevention of constipation. Among the many references to this condition is found the statement (page 227), "Constipation in the infant is inevitable if little importance has been attached to emptying the bowel or insufficient time devoted to this act. Bowel control may be instituted by proper training during the first months of life." The giving of prune juice is advised as early as two weeks of age for the prevention of constipation; the use of orange juice for its vitamin C content is recommended in the first week of life on page 46, whereas the feeding schedule on page 182 advocates it at one month of age.

The defects of this book tend to outweigh the usefulness of other portions. Because the uninformed mother cannot distinguish between fact and fiction in the field of childhood nutrition, the book is not to be recommended.

P. C. JEANS

## BOOKS RECEIVED

- SEROLOGY IN SYPHILIS CONTROL. Principles of Sensitivity and Specificity. By Reuben L. Kahn. Baltimore: Williams & Wilkins, 1942. 206 pp. Price, \$3.00.
- ANATOMY AND PHYSIOLOGY FOR NURSES. By W. Gordon Sears. Baltimore: Williams & Wilkins, 1942. 376 pp. Price, \$2.50.
- PERSONAL AND COMMUNITY HEALTH. By C. E. Turner. 6th ed. St. Louis: Mosby, 1942. 652 pp. Price, \$3.50.
- NURSING—AN ART AND A SCIENCE. By Margaret A. Tracy. 2d ed. St. Louis: Mosby, 1942. 754 pp. Price, \$3.50.
- CHEMISTRY AND PHYSIOLOGY OF THE VITAMINS. By H. R. Rosenberg. New York: Interscience, 1942. 674 pp. Price, \$12.00.
- MEMORABLE DAYS IN MEDICINE. By Apul F. and Alice Schiedt Clark. Madison: University of Wisconsin Press, 1942. 305 pp. Price, \$2.00.
- HUGHES PRACTICE OF MEDICINE. Revised and edited by Burgess Gordon. 16th ed. Philadelphia: Blakiston, 1942. 791 pp. Price, \$5.75.
- THE MEN WHO MAKE THE FUTURE. By Bruce Bliven. New York: Duell, Sloan and Pearce, 1942. 325 pp. Price, \$2.75.
- HISTORY OF THE SCHOOL OF NURSING OF THE PRESBYTERIAN HOSPITAL, NEW YORK, 1892-1942. By Eleanor Lee. New York: Putnam, 1942. 286 pp. Price, \$3.50.
- PERSONALITY AND MENTAL ILLNESS. By John Bowlby. New York: Emerson, 1942. 280 pp. Price, \$2.75.
- SOLVING SCHOOL HEALTH PROBLEMS. By Dorothy B. Nyswander. New York: Commonwealth, 1942. 377 pp. Price, \$2.00.
- HEALTH IN SCHOOLS. TWENTIETH YEARBOOK. Washington: American Association of School Administrators, 1942. 544 pp. Price, \$2.00.
- AMERICAN POCKET MEDICAL DICTIONARY. By W. A. Newman Dorland. 17th ed. Philadelphia: Saunders, 1942. 1037 pp. Plain edition, \$2.00; Thumb Indexed, \$2.50.
- ESSENTIALS OF NURSING. By Helen Young and Associates. New York: Putnam, 1942. 609 pp. Price, \$3.00.
- ANNUAL REVIEW OF PHYSIOLOGY. Vol. IV. James Murray Luck, Editor. Stanford University, Annual Reviews, 1942. 709 pp. Price, \$5.00.
- MANUAL FOR THE CONDUCT OF CLASSES FOR EXPECTANT PARENTS. By Ellen D. Nicely and Assistants. Cleveland: Cleveland Child Health Association, 1942. 167 pp. Price, \$1.50.
- SEX GUIDANCE IN FAMILY LIFE EDUCATION. By Frances Bruce Strain. New York: Macmillan, 1942. 340 pp. Price, \$2.25.
- THE PEOPLE AGAINST TUBERCULOSIS. THE STORY OF THE CHRISTMAS SEAL. By Leigh Mitchell Hodges. New York: National Tuberculosis Association, 1942. 54 pp. Price, \$1.00.
- NURSING OF CHILDREN. By Gladys Sellow. 5th ed. Philadelphia: Saunders, 1942. 579 pp. Price, \$2.75.
- THE LIFE OF FLORENCE NIGHTINGALE. By Sir Edward Cook. New York: Macmillan, 1942. (1 Vol. reissue.) 510 pp. Price, \$4.50.
- HELP YOUR DOCTOR TO HELP YOU SERIES. Heart Disease, High Blood Pressure, Constipation, Insomnia. New York: Harper, 1942. Each \$.95.
- TRAINING MANUAL FOR AUXILIARY FIREMEN. Boston: National Fire Protection Association, 1942. 406 pp. Price, \$1.50.
- A HANDBOOK FOR ASSISTANT MEDICAL OFFICERS OF HEALTH ON CHILD WELFARE AND SCHOOL MEDICAL WORK. By F. J. G. Lishman. London: Lewis, 1942. 63 pp. Price, \$1.50.
- AMERICAN FOUNDATIONS AND THEIR FIELDS. Compiled by Geneva Seybold. New York: Raymond Rich Associates, 1942. 274 pp.
- W. K. KELLOGG FOUNDATION. THE FIRST ELEVEN YEARS, 1930-1941. Battle Creek: Trustees of the W. K. Kellogg Foundation, 1942. 217 pp.



## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**Federal Venereal Disease Program in Action**—In this series is told what the War and Navy Departments and the U. S. Public Health Service and the Social Protection Section of the Defense Health and Welfare Services are doing about controlling syphilis and gonorrhea.

ANON. (Four papers) Fit to Fight—and Fit for Life, "Best Traditions of the Service . . .," "Health Is the States' Foundation . . .," Safeguards Plus Salvage. *J. Social Hyg.* 28, 1:3 (Jan.), 1942.

**Venereal Disease among Industrial Workers**—Four and a half per cent of the first million draft selectees had syphilis. One of every 42 in the general population has the disease now. How great is the loss of time and efficiency due to the disease we shall never know, but it is evident that public health administrators, employers, and employees ought to be on the job preventing that loss. "In time of peace industrial hygiene is a tool. In time of war, we must make it a weapon."

ANON. Health Builds Manpower. (An editorial summarizing seven papers on V. D. in industry.) *J. Social Hyg.* 28, 2:103 (Feb.), 1942.

**Vitamins Important? So Are Emotions**—Six articles giving a bird's eye view of nutrition with a mental health slant, prepared primarily for classroom teachers, but of equal value for health educators, full- or part-time.

BINGLER, C. A Word to Teachers About Eating Habits (and five related papers). *Understanding the Child* 9, 1:3 (Apr.), 1942.

**Some Light upon the Great Darkness**—We may consider the possibility now of preventing several forms

of cancer in man by attacking the disease at its origin instead of remaining on the defensive until the disease has opened the attack. This is the hopeful conclusion of an able discussion of the question, Why does a patient get cancer?

CRAMER, W. The Origin of Cancer. *J.A.M.A.* 119, 4:309 (May 23), 1942.

**About Leeuwenhoek, *et al.***—In this discourse covering four and a half centuries of public health and the place of the laboratory at the end of that time, there is much quotable material. One nugget: "We do not want too many epidemiologists whose chief functions . . . are the compiling of convincing itineraries to cover where they went and what they did on their latest peregrination, . . ."

DOLMAN, C. E. The Changing Place of the Laboratory in Public Health. *Canad. Pub. Health J.* 33, 5:185 (May), 1942.

**Today's Lepers Are Lucky**—As the day may come when you may have need to tell someone this reassuring story, make a note that there is available an excellent description of the modern leprosarium at Carville. Each year from 40 to 60 new cases are discovered and admitted.

FACET, G. H. The Story of the National Leprosarium (U. S. Marine Hospital) Carville, Louisiana. *Pub. Health Rep.* 57, 18:641 (May 1), 1942.

**Laboratory Note**—Chicks are recommended as a substitute for rabbits or guinea pigs in testing virulence of the diphtheria bacillus.

FROBISHER, M., JR., *et al.* The Use of Chicks in Testing the Virulence of *Corynebacterium diphtheriae*. *Am. J. Hyg.* 35, 3:381 (May), 1942.

**For Radium Dial Painters—**Increased demand for luminous dials and time pieces has put radium painting on a broader scale. With properly vented work tables and established safe shop practices, it can be done without jeopardy to health and life. This article tells how.

HEMEON, W. C. L., and EVANS, R. D. Ventilation Requirements for Radium Dial Painting. *J. Indust. Hyg. & Toxicol.* 24, 5:116 (May), 1942.

**Shall We Save Children's Teeth?**—After age six, so dental surveys have shown, permanent teeth are attacked at a constant rate of three-fourths of a tooth per child per year. Thirty million children would accumulate 22,500,000 carious teeth each year, but they could be cared for with only 18 per cent of the American dentists' available time and the more important prophylactic work need not take a disproportionate share of this time either. Many public health officials assume that the job to be done is too great, and the cost prohibitive, so they do nothing. This paper persuasively proposes that as something can be done, something should be done to tackle the job realistically.

KNUTSON, J. W. Appraising the Dental Health Program. *J. Am. Dental Assoc.* 29, 4:543 (Apr.), 1942.

**Polio Epidemic Studied—**Epidemiologic evidence indicates that, during one poliomyelitis outbreak, the infection was spread mainly not by contact but by certain vectors unknown. Animals, houseflies, blowflies, mosquitoes, and fleas are considered as possible vectors. On the whole, the picture indicated spread of infection by place rather than person.

LUMSDEN, L. L. An Epidemiological Study of Poliomyelitis in Mississippi in 1941. *Pub. Health Rep.* 57, 20:729 (May 15), 1942.

**Contacts, Not Fomites, Spread Scabies—**Three British papers on the

transmission, the treatment and the control of scabies will interest those of us who may be pestered with the control of this condition. Evidently in England there has been an increase in the endemic infestation. Recognition of early cases and control of carriers, rather than fomites, are the great needs.

MELLANBY, K., *et al.* Transmission and Prevention of Scabies (and two related papers). *Public Health* 40, 8:150 (May), 1942.

**Rejectees with Syphilis and Gonorrhea—**In one state, public health nurses are assigned to the army induction stations where all selectees are examined. A quick blood test and a microscopic examination inform the authorities in a few hours which of the selectees are venereally infected. Before each of these leaves the station he is interviewed by the nurse, plans are made for his treatment, and information about the source of infection is obtained. Would that every state did as much!

MOORE, H. B., and DILL, E. R. Venereal Disease Program for Rejectees. *Pub. Health Nurs.* 34, 5:266 (May), 1942.

**Public Health in the War—**Today health agencies face their supreme test, that of adapting themselves to broader purposes than that for which they were organized, concludes the Surgeon General. What he has to say to the Conference of State and Territorial Health Officers suggests that some of us are not making too successful a beginning on meeting that supreme test. If you haven't already done so, read this paper, and the proceedings of the conference which follow it.

PARRAN, T. Opening Remarks to the Fortieth Annual Conference of the United States Public Health Service with the Conference of State and Territorial Health Officers. *Pub. Health Rep.* 57, 19:691 (May 8), 1942.

**Lily Painting Department—**Here is proof that the risk of tuberculosis

is very great for colored associates of sputum positive cases—if you should be in need of this proof.

PUFFER, R. R., *et al.* Tuberculosis Studies in Tennessee. *Am. J. Hyg.* 35, 3:367 (May), 1942.

#### First Aid Treatment for Gas—

What to do—and emphatically what not to do—in giving first aid to victims of lung irritants, mustard and tear gases, nerve and blood poisons, carbon monoxide, and phosphorus. Certainly every health worker should be ready with this information, and this is an excellent article.

WAITT, A. H. War Gas Cases. *Am. J. Nurs.* 42, 5:489 (May), 1942.

#### Proprietary Vitamin Products—

Although the needed intake of the vitamin B complex may be obtained from a satisfactory diet of ordinarily ob-

tainable foods, many American diets are low in this essential. A survey of a number of vitamin B preparations indicates that many of them are wholly inadequate sources. The economic waste involved in producing and using these questionable dietary supplements must be great.

WILLIAMS, R. J. The Approximate Vitamin Requirements of Human Beings. *J.A.M.A.* 119, 1:1 (May 2), 1942.

More About Vitamins—If you are one who likes occasionally to take his intellectual nose from the grindstone of severely “practical” information anent his job, then you may enjoy these two entertaining though scholarly papers on what we know, what we don’t know, what we hope to know about vitamins.

WILLIAMS, R. R., and WILLIAMS, R. G. Vitamins in the Future. *Science* 95, 2466:335 (Apr. 3), 1942.

# ASSOCIATION NEWS

## SEVENTY-FIRST ANNUAL MEETING

ST. LOUIS, MO., OCTOBER 27-30, 1942

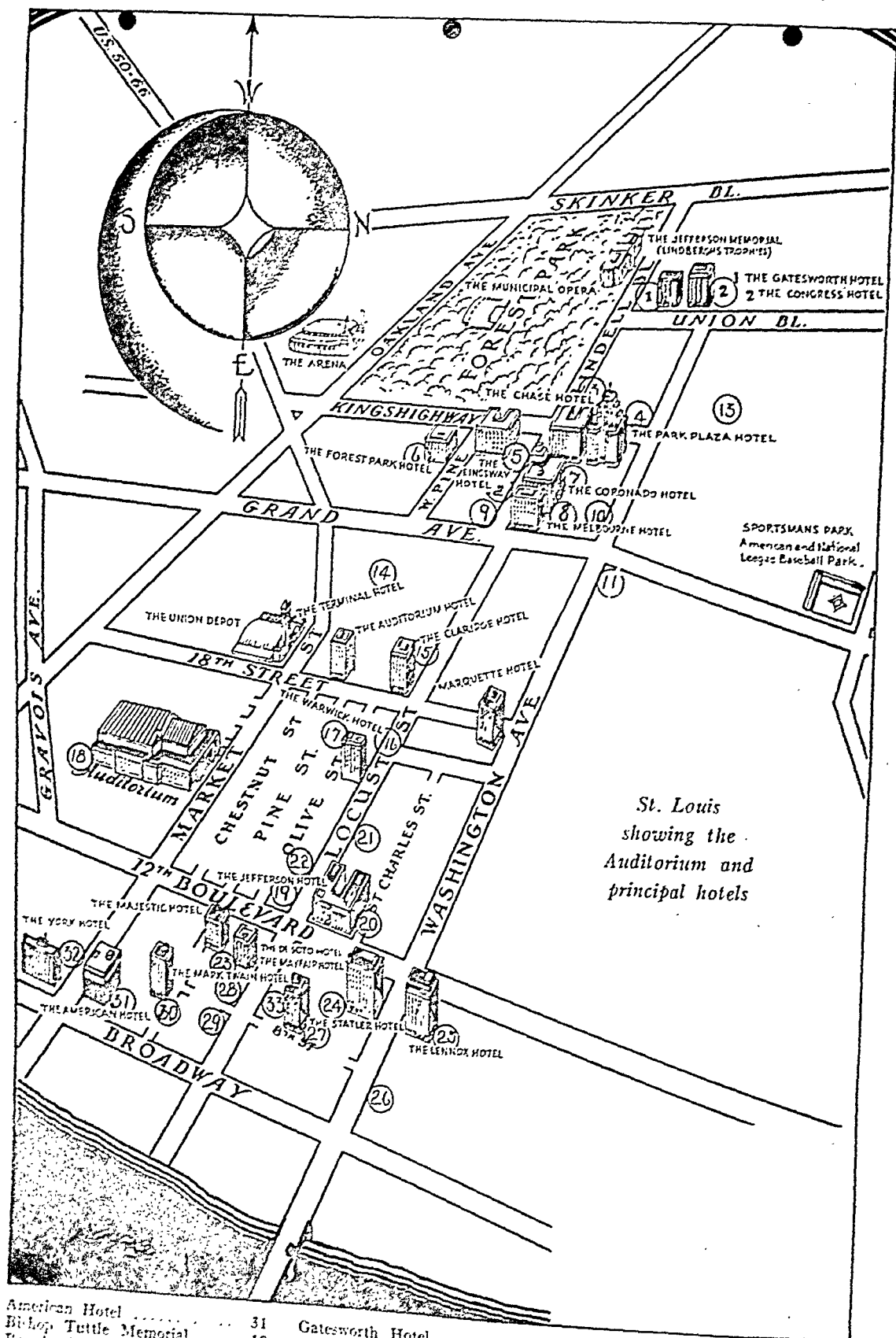
*Meeting Headquarters: Municipal Auditorium*

*Residence Headquarters: Hotels Jefferson and Statler*

### RAILROAD FARES FROM VARIOUS POINTS TO ST. LOUIS, MO.

*American Public Health Association  
October 27-30, 1942*

<i>From</i>	<i>One-way for Pullman Travel</i>	<i>Round-trip for Pullman Travel</i>	<i>One-way Lower Berth</i>	<i>One-way Upper Berth</i>
Atlanta, Ga.	\$20.80	\$31.20	\$5.25	4.00
Baltimore, Md.	29.65	53.55	6.95	4.80
Boston, Mass.	40.10	72.20	9.25	6.40
Buffalo, N. Y.	23.70	43.80	5.80	4.40
Chicago, Ill.	9.65	14.45	2.95	2.20
Cleveland, Ohio	17.60	33.20	4.35	3.30
Dallas, Tex.	22.00	33.05	6.40	4.90
Denver, Colo.	30.05	45.10	7.90	5.95
Duluth, Minn.	23.95	35.95	6.40	4.90
Fort Worth, Tex.	22.45	33.65	6.40	4.90
Indianapolis, Ind.	8.20	16.05	2.95	2.00
Jacksonville, Fla.	31.10	46.65	8.10	6.20
Kansas City, Mo.	9.20	13.80	2.95	2.20
Louisville, Ky.	9.40	14.10	2.95	2.00
Los Angeles, Calif.	67.10	94.15	17.35	13.20
Memphis, Tenn.	10.25	15.40	2.95	2.20
Milwaukee, Wis.	12.45	18.65	3.50	2.65
Minneapolis, Minn.	19.30	28.95	4.35	3.30
Nashville, Tenn.	11.20	16.80	2.95	2.20
New Orleans, La.	25.60	38.45	6.80	5.15
New York, N. Y.	34.85	62.80	8.45	5.80
Omaha, Nebr.	13.85	20.80	3.50	2.65
Philadelphia, Pa.	31.90	57.40	7.85	5.40
Pittsburgh, Pa.	20.40	38.10	4.95	3.45
Portland, Ore.	72.10	94.15	17.35	13.20
Salt Lake City, Utah	46.30	64.70	11.90	9.05
San Francisco, Calif.	67.10	94.15	17.35	13.20
Seattle, Wash.	72.95	94.15	17.35	13.20
Washington, D. C.	29.65	53.55	6.95	4.80
Montreal, Que.	37.55	67.05	9.25	6.40
Halifax, N. S.	65.20	91.60	17.35	13.20
Ottawa, Ont.	34.25	61.60	8.45	5.80
Quebec, P. Q.	43.80	78.20	9.25	6.40
Toronto, Ont.	24.90	44.30	5.80	4.40
Vancouver, B. C.	72.95	94.15	17.35	13.20



St. Louis  
showing the  
Auditorium and  
principal hotels

American Hotel	31	Gatesworth Hotel	1	St. Louis University	9
Bishop Tuttle Memorial	19	Jefferson Hotel	20	Scruggs-Vandervoort-Barney	28
Board of Education	53	Kingsway Hotel	5	Sheldon Memorial	10
Chase Hotel	3	Lennox Hotel	25	Statler Hotel	24
Claridge Hotel	15	Mark Twain Hotel	30	Stix, Baer & Fuller	26
Congress Hotel	2	Mayfair Hotel	27	Third Baptist Church	11
Covadito Hotel	7	Melbourne Hotel	8	Vashon High School (Negro)	14
DeSoto Hotel	23	Municipal Auditorium	18	Warwick Hotel	17
Leks Club	12	Park Plaza Hotel	4	Y.M.C.A.	16
Famous-Barr	29	Public Library	22	York Hotel	32
Forest Park Hotel	6	Roosevelt Hotel	13	Y.W.C.A.	21

RATES QUOTED BY ST. LOUIS HOTELS

Seventy-First Annual Meeting, October 27 to 30, 1942

AMERICAN PUBLIC HEALTH ASSOCIATION

ALL RATES QUOTED ARE FOR ROOMS WITH BATH  
ON EUROPEAN PLAN

Hotel	Single	Double	Suites
New Hotel Jefferson	\$3.00-5.00-6.00-7.00	\$6.00-7.00-7.50-8.00	\$12.00-20.00
Statler	3.00-3.50-3.75-4.00	5.25-6.00-6.25-6.50	17.00-18.00
	4.25-4.75-5.00	6.75-7.00-9.00	
American	2.00-2.50	3.50-4.00	
Claridge	2.50-3.00	3.50-7.00	
Coronado	2.25 (shower)	4.50-5.00	6.00
	2.75		
DeSoto	2.65-up	4.00-5.00	8.00
Lennox	3.50-4.00-4.50-5.00	4.50-5.00-6.00-7.00	10.50-14.50
	6.00	8.00	
Mark Twain	2.50-4.00	3.50-5.00-5.50	
Maryland	2.25-2.50-2.75	3.25-3.50-3.75-4.00	
		4.50	
(without bath)	1.75-2.00	2.75-3.00	
Mayfair	3.00-3.50-4.00-5.00	4.00-4.50-5.50-6.00	
		7.00	
Melbourne	2.65-3.20-3.70-4.20	4.20-4.80-5.30-5.80	
		6.20	
Park Plaza	4.50	6.00-8.00	12.00-18.00
Warwick	2.00-2.50-3.00	3.00-3.50-4.00-4.50	7.00-10.00
		5.00	

.....(Cut off on this line and mail to the hotel of your choice).....

HOTEL RESERVATION BLANK FOR THE ST. LOUIS MEETING  
AMERICAN PUBLIC HEALTH ASSOCIATION, OCTOBER 27-30, 1942

To .....  
(Name of Hotel)

Please reserve for me ..... rooms for ..... persons  
for the A.P.H.A. Meeting.

Single room ..... Double room .....  
Maximum rate per day for room \$. ..... Minimum rate per day for room \$. .....

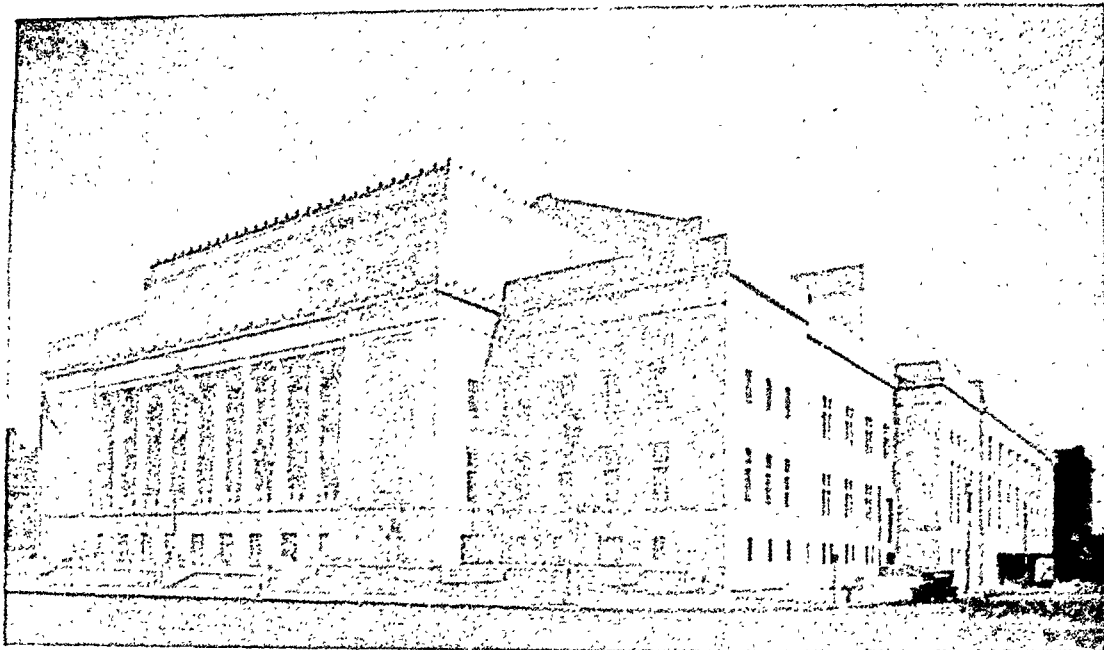
I expect to arrive ..... If date of arrival is changed I will notify  
you at least 24 hours in advance.

Please acknowledge this reservation.

Name .....

Street Address.....

City..... State.....



*The new \$7,000,000 Municipal Auditorium, occupying more than a city block.  
The auditorium will seat up to 11,500 persons.*

## The Seventy-first Annual Meeting in St. Louis

**Y**OU who have been to St. Louis before won't recognize her face or figure when you rail, bus, motor, or plane into town October 25 or 26 for the annual convention of the American Public Health Association.

For one thing, that old dirty face is gone. The city's smoke elimination program, which has been given nationwide publicity, has been increasingly effective since its inauguration two years ago. Her citizens are literally breathing freer—and the old lady, herself, is becoming more vain each day as she adopts the use of cosmetics and soap and water—painting and sand-blasting—for a fresh appearance.

St. Louis's old figure also is becoming more streamlined. Do you remember the sprawling river front? The old buildings have been torn down and a beautiful park—the Jefferson National Expansion Memorial—has been planned. Government model housing projects also are under way and some predict that St. Louis, long known as the city of beautiful homes, soon will be known as the "model city."

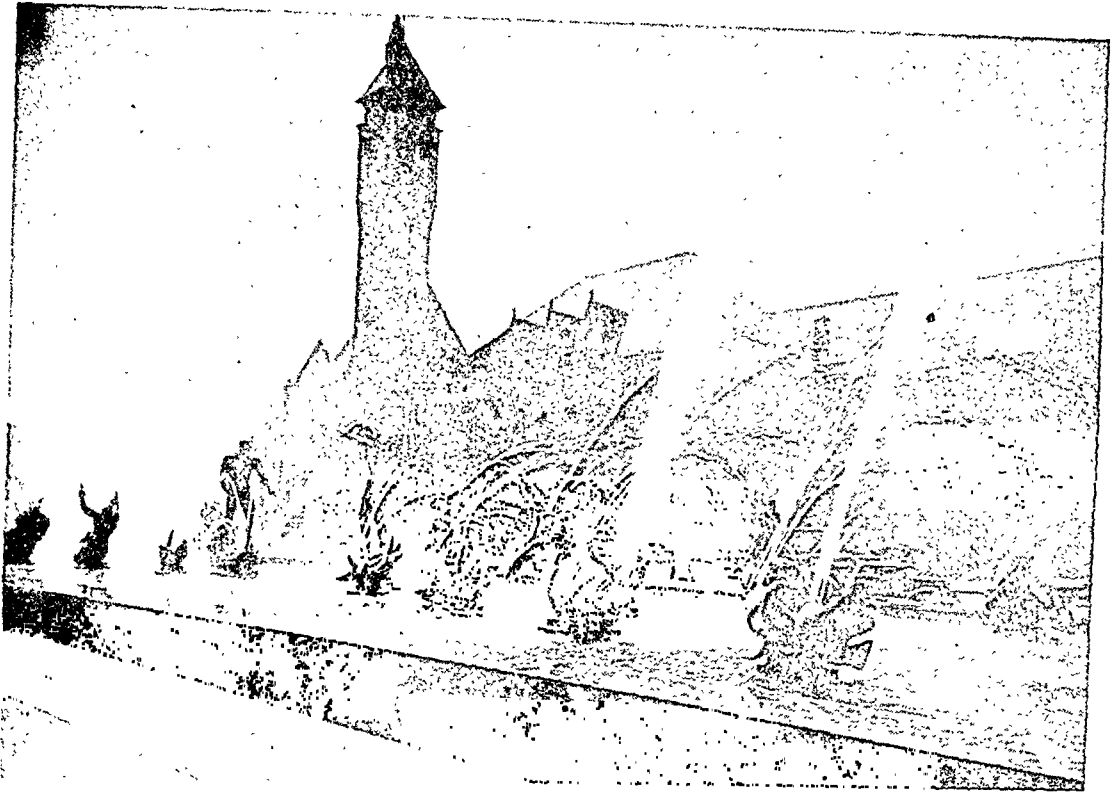
### THE GATEWAY TO THE WEST

The story of St. Louis is one of the most colorful pages in American history. Just 401 years ago, in 1541, the Spanish adventurer, Hernando De Soto, and a handful of goldseekers discovered the Mississippi River. Two hundred and twenty-three years later, in 1764, Pierre Laclede and Auguste Chouteau founded its greatest city—St. Louis.

From fur trading outpost to industrial center—from French and Spanish rule to American Democracy—from 30 hardy pioneers to 1,500,000—through fires and floods, Indian raids and wars, financial panics and depressions, St. Louis has become ever more virile and far sighted. It is one of the nation's most modern cities now. But the colorful landmarks of the sturdy frontier town still stand.

### FRONTIER LANDMARKS

Outstanding is the old Courthouse at Broadway and Chestnut Street. It was there that the famous Dred Scott case was tried—a case on the legality of slavery which changed the course of



*The Meeting of the Waters, by Carl Milles—on Aloe Plaza across the street from Union Station.*

American history. Slaves once were sold at the stone auction block at the east door. It was the starting point of the Daniel Boone trial. It was there that Henry Clay attended court and sold real estate.

Even closer to the river is St. Louis's oldest building—the Old Rock House—a famed rock structure once used as a depot for supplies and furs for traders. Not far from it is the nationally known Old Cathedral on the river front, site of the first Mass in 1764. The origin of St. Louis is epitomized on the portico with three inscriptions—French, Latin, and English. To sweeten the bell's tone, 200 Spanish dollars were cast with other metal. Not far from the heart of the city stands Grant's Log Cabin, occupied by the famous Civil War general when he was a St. Louis resident.

Among other points of interest to the history-minded visitor are the site of the old National Hotel, which once housed Daniel Webster, Abraham Lin-

coln, and others; the Eugene Field House, where St. Louis's famous poet was born and lived most of his life, and the Dent-Grant House, where General Grant married Julia Dent.

For a living story of what made Missouri great, the visitor has only to see the rare historic collection at Jefferson Memorial, located at the entrance to the grounds of the 1904 Louisiana Purchase Exposition, in Forest Park. Rare books, precious manuscripts, Indian relics, and objects of pioneer days are housed in the Memorial.

Upon these solid foundations of law and freedom, religion and art, trade and industry—typified in these old landmarks—St. Louis was built.

#### MODERN ST. LOUIS

But what of modern St. Louis? St. Louisans like to boast that one never is at a loss for things to see or do.

If you arrive by train, the first thing that strikes your view is the beautiful



statue by the famed Swedish sculptor, Carl Milles—"The Meeting of the Waters"—directly across from Union Station. The fountain symbolizes the junction of the Mississippi and Missouri Rivers, while the huge railway station, modeled after the gates of Carcassone, is the actual junction of rail lines, 19 of them from all sections of the country.

Going to your hotel, which is but a short ride from the station, you cannot help noticing the beautiful downtown buildings—the magnificent new Civil Courts Building, the United States Customs and Courthouse, the old City Hall and Municipal Courts Building.

#### "OLE MAN RIVER"

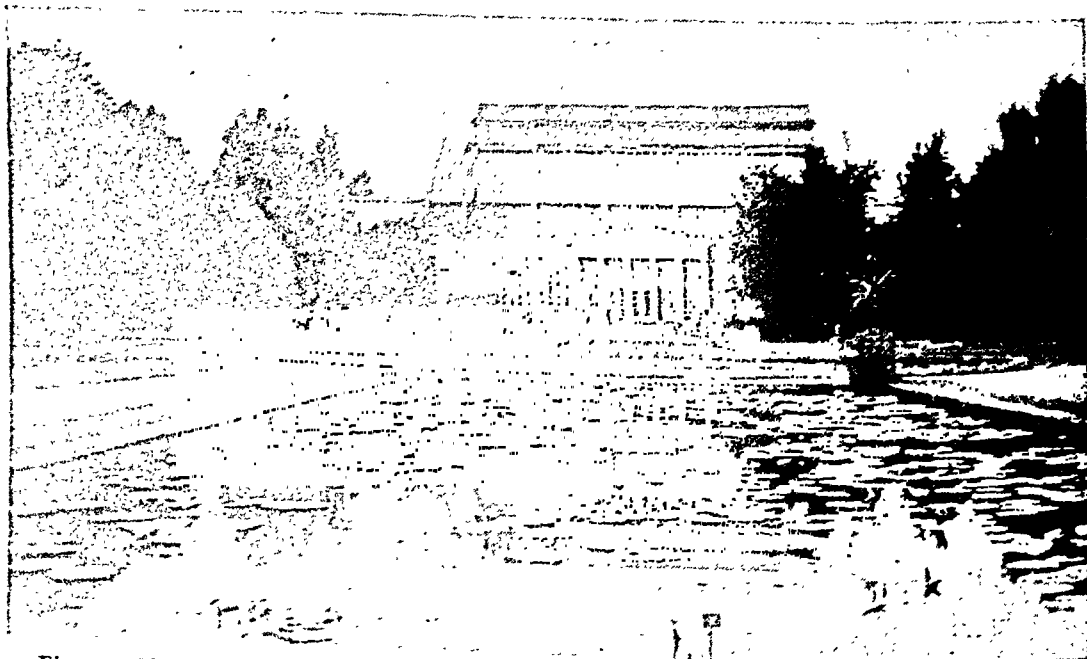
Perhaps you'd like to see a little more of the city before your convention opens? Of course, you'll want to go down to the old river front to watch the tugs slowly pushing barges loaded with vital war materials down the river. Now and then, a colorful, old river packet of the type described by Mark Twain moves slowly upstream, in sharp contrast to the sleek coast guard cutters

and small motor launches. Near impressive Eads Bridge, the world's first steel-truss bridge, built in 1874 at a cost of nearly \$10,000,000, you'll see the world's largest inland excursion boat—the million dollar, streamlined, and air-conditioned S. S. Admiral.

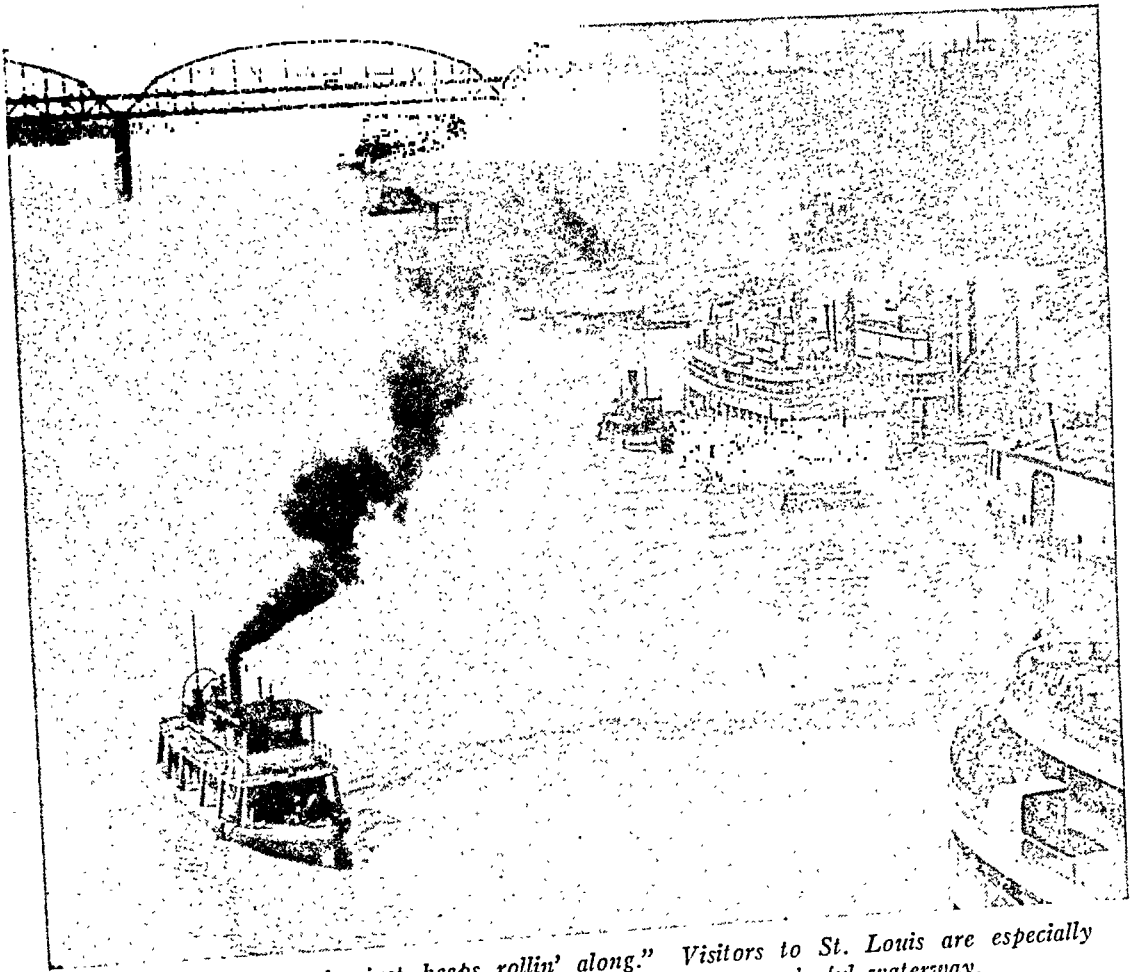
Perhaps you'll have time for the short ride to one of the country's largest parks. Out at Forest Park, there is something for every taste. Do you like sports? In the park, as in other spots throughout the city, are facilities for golf, baseball, fly-casting, tennis, picnicking.

#### CIRCUS DAY

Do you get a kick out of a circus? Well, St. Louis has one every day at the Zoo, reputed to be one of the most complete exhibits of animal life in the world. And no trip to St. Louis is complete without a jaunt or two to Forest Park to watch the chimpanzees, elephants, and cats strut their stuff in twice or three times daily shows. Two rare pandas, Happy and Pao Pei, tumble around constantly for the visitors' amusement.



*Flowers bloom all year in St. Louis. Here is a scene at the famous Shaw's Garden.*



*"Ole Man River—she just keeps rollin' along." Visitors to St. Louis are especially anxious to see the Mississippi, the world's most colorful waterway.*

Each year, millions of visitors watch Jimmy, the trained chimp, and his "gang" turn backward somersaults, ride bikes, smoke cigarettes, play in an orchestra, and put trained ponies and dogs through their paces. Others like to watch the feeding of barking sea lions, the clumsy wanderings of the bears, or the awe-inspiring force-feeding of the giant boa-constrictor.

The zoo is huge. It covers more than 77 acres and houses thousands of mammals, birds, fish, and reptiles. Its most outstanding feature is its unusual back-to-nature barless "cages." Every effort has been made to simulate the natural surroundings of the particular animals' habitats.

Are you interested in art? The St. Louis Art Museum officials have dem-

onstrated that one does not have to be in the lorgnette class to enjoy fine painting and sculpture. The policy of appealing to the great class of people who have had no special training in art was foremost in the minds of the museum's founders—and a policy which has been followed throughout its history since it was originated in free evening drawing classes sponsored in 1874 by Washington University to the present day.

The museum is housed in a huge million dollar building of Bedford stone on "Art Hill," in the central western section of Forest Park. An impressive statue of bronze—"St. Louis, the Crusader"—stands before the building. Among the most interesting exhibits at the museum are the period rooms, which include medieval displays, a Gothic

Court, early French rooms, a Hispano-Moorish Court, and five American and five European period rooms. There are excellent collections of Oriental rugs and Chinese ceramics.

#### FLOWERS IN OCTOBER

Do you like puttering around in the garden? Then, don't miss seeing the floral exhibits at the Jewel Box in the park. The St. Louis Park Department offers a changing display of plants from 500,000 floral specimens grown in the park greenhouse. The Jewel Box is uniquely designed in the modern manner in steel and glass. Incidentally, you also will want to see the Missouri Botanical Garden, better known as Shaw's Garden, down in South St. Louis. It is rated with the Kew Gardens of London as the greatest in the world from the standpoint of completeness of collections. Its 75 acres are especially noted for rare lily hybrids and orchids.

Yes . . . and there are many more interesting things to be seen in St. Louis, too—just ask any of the friendly people you run into on the street. St. Louisans

brag that their amusement spots—night clubs, theaters, stage plays—can't be beat. But, they are even more proud of their churches, schools, hospitals, and homes. They like sports teams and their symphony. . . .

#### ALL-AMERICAN CITY

The St. Louisan is an all-American. For to St. Louis have come residents of every other section of the country. He has the strength of the North, the friendliness of the South, the experience, knowledge, and tradition of the East, the far-sightedness of the West.

Make arrangements now to attend our annual convention in St. Louis, October 26 to 30. Clear your desk; jot it down on your memo pad. For one of the most helpful and interesting conventions in the history of the American Public Health Association, we'll see you in St. Louis!

This is the physical setting for the Association's 71st Annual Meeting. In the August JOURNAL we shall tell you what St. Louis has to show you as a public health worker.

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#### CLOSING DATE FOR SUBMITTING FELLOWSHIP APPLICATIONS

**M**EMBERS who may be interested in applying for Fellowship in the A.P.H.A. are hereby advised that Fellowship applications should be received not later than August 1, to insure consideration at the 71st Annual Meeting.

**WANTED:** The following issues of the *American Journal of Public Health*—July and August, 1941; and January, 1942. The Association will be glad to pay postage.

## APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

### *Health Officers Section*

Franklin V. Boyd, M.D., St. Landry Parish Health Unit, Opelousas, La., Director  
Edward W. Colby, M.D., 173 Water St., Exeter, N. H., Health Officer, Eastern Health Dist., State Board of Health  
James M. Coram, M.D., Health Dept., Beckley, W. Va., Raleigh County Health Officer  
Thomas D. Fitzgerald, M.D., M.S.P.H., University Health Service, Ann Arbor, Mich., Physician  
Richard P. Good, M.D., 308 Armstrong Landon Bldg., Kokomo, Ind., Vice-President, City Board of Health  
Thomas L. Harvey, M.D., 805 Lincoln Ave., Newport, Tenn., Director, District Health Dept.  
Eugene L. Kidd, M.D., Chehalis, Wash., Lewis County, Health Officer  
Helen P. Lanting, M.D., M.S.P.H., Gladwin, Mich., Director, Tri-County Health Dept.  
Clarence R. Lindgren, M.D., Lane County Court House, Eugene, Ore., Lane Co. Health Officer  
Alexander S. Mack, M.D., 320 Locust St., Oak Harbor, Ohio, Ottawa County Health Commissioner  
Charles W. Reid, M.D., Madison-Tensas Bi-Parish Health Unit, Tallulah, La., Director  
Reuben F. Reider, M.D., D.P.H., 307 S. Wright St., Champaign, Ill., Director, Champaign-Urbana Public Health Dist.  
Oscar Rogol, M.D., C.M., 135 Main St., Seymour, Conn., Health Officer, Town of Oxford  
William T. Veal, M.D., 99 Water St., Stonington, Conn., Health Officer  
Michael A. Viggiano, M.D., New Martinsville, W. Va., Wetzel County Health Officer  
J. Margaret Warner, City Hall, Burlington, N. J., Sanitary Inspector, City Board of Health  
Winfield E. Wight, M.D., 24 Goodwin Court, Thomaston, Conn., Health Officer  
Angelo M. Williams, M.D., M.P.H., 56 Highland St., Burgettstown, Pa., Dist. Medical Director, State Dept. of Health

### *Laboratory Section*

James H. Baker, M.A., 110 W. 18th St.,

New York, N. Y., Chemist, Gar-Baker Laboratories, Inc.

Ernest H. Blaustein, A.B., 36 Quincy St., Roxbury, Mass., Student, Massachusetts Institute of Technology

Hernando Groot, M.D., 55 Shattuck St., Boston, Mass., Student, Harvard School of Public Health

Roberto Nevarez, M.D., 59 Hancock St., Boston, Mass., Student, Harvard School of Public Health

Ross A. Snider, M.S., E. Third & Kilgour Sts., Cincinnati, Ohio, Asst. Chemist, U. S. Public Health Service

Gustave B. Ulvin, Ph.D., 130 W. Garfield Blvd., Chicago, Ill., Chief Chemist and Bacteriologist, Sidney Wanzer & Sons

Bernard Witlin, Sc.D., P. O. Box 3378, Honolulu, T. H., Bacteriologist, Territorial Board of Health

### *Engineering Section*

Norman G. Ambrosini, B.S., 105 South F. St., Aberdeen, Wash., County Sanitarian, Grays Harbor Public Health Dept.

Ernest C. Anderson, M.S., Wichita Health Unit, Wichita Falls, Tex., Asst. Public Health Engineer, U. S. Public Health Service

Holbrook A. Bourne, M.P.H., 550 Main St., Hartford, Conn., Acting Director, Bureau of Food and Sanitation, City Board of Health

Edward B. Carroll, A.B., 709 Ridgeway Ave., Morgantown, W. Va., Senior Sanitarian, Public Health Training Center

Lieut. Henry M. Chick, Station Hospital, Fort Jackson, S. C., Sanitary Corps, U. S. Army

Ralph S. Lake, 427 E. State St., Rockford, Ill., Chief Plumbing Inspector, City of Rockford

Lieut. Irvin M. Lefton, M.S.P.H., 4028 North 16th St., Milwaukee, Wis., Student (Army Sanitation), Carlisle Barracks, Pa.

Edmund G. Wagner, B.S., Univ. Campus, State Dept. of Health, Minneapolis, Minn., Public Health Engineer, Div. of Sanitation

John B. Wallace, B.S., P. O. Box 204, New Martinsville, W. Va., Sanitarian, Wetzel County Health Dept.

Harry W. Weeks, 637 W. Edwards St., Springfield, Ill., Asst. State Director, Com-

munity Sanitation, State Dept. of Public Health

#### *Industrial Hygiene Section*

- Knowlton J. Caplan, M.S., St. Louis County Health Dept., Clayton, Mo., Industrial Hygiene Engineer  
David M. Gould, M.D., 8302 16th St., Silver Spring, Md., Asst. Surgeon (R), U. S. Public Health Service  
Clarence Kooiker, M.D., U. S. Public Health Service, Washington, D. C., Asst. Surgeon (R), States Relations Div.  
Cedric Northrop, M.D., 1412 Smith Tower, Seattle, Wash., Tuberculosis Control Officer, State Health Dept.

#### *Food and Nutrition Section*

- Helen P. Hostetter, M.S., 620 Mills Bldg., Washington, D. C., Editor, *Journal of Home Economics*, American Home Economics Assn.  
Louise S. Moody, B.S., LaMoille, Ill., Nutritionist, State Dept. of Health  
Leone Pazourek, M.S., 212 W. Monroe St., Springfield, Ill., Nutrition Consultant, State Dept. of Public Health  
Benjamin P. Sandler, M.D., 1224 Walton Ave., Bronx, N. Y., Physician, Navy Yard Dispensary

#### *Maternal and Child Health Section*

- Leonard Parente, M.D., M.P.H., 126 Church St., Hamden, Conn., Student, Yale Univ.

#### *Public Health Nursing Section*

- Helen Brazonis, 308 W. Walnut St., Carbonale, Ill., Public Health Nurse, State Dept. of Public Health  
Martha Buric, Logan County Health Dept., Logan, W. Va., Public Health Nurse  
L. Dorothy Carroll, B.S., 305 Euclid Ave., Morgantown, W. Va., Asst. Public Health Nursing Consultant, U. S. Public Health Service  
Helen M. Culp, R.N., Box 791, Lawton, Okla., Public Health Nurse, U. S. Public Health Service  
Bernadine M. Dougherty, R.N., 149 North St., New Martinsville, W. Va., Clinical Nurse, Wetzel County Health Dept.  
Bertie J. Ferrell, Logan County Health Dept., Logan, W. Va., Public Health Nurse  
Genevieve E. Finnen, P. O. Box 104, Newport, Ky., Public Health Nurse, U. S. Public Health Service  
Virginia V. Hand, 2213 Marshall Ave., Elm

- Grove, Wheeling Station, W. Va., County Health Nurse, City-County Health Dept.  
Isabelle R. MacCann, 1512 Virginia St., Charleston, W. Va., Dist. Nursing Supervisor, State Dept. of Health  
Helen M. Marcy, R.N., A.B., Box 1263, Lakeview, Ore., Lake County Public Health Nurse  
Marguerite A. Maxwell, 205 Maple St., New Martinsville, W. Va., Maternity and Delivery Service Trainee, State Health Dept.  
Mary H. Reese, R.N., P. O. Box 974, Las Cruces, New Mexico, County Nurse, Dona Ana County Health Dept.  
M. Virginia Welch, 222 E. Oak St., Arcadia, Fla., Public Health Nurse

#### *Public Health Education Section*

- Mary K. Ferguson, R.N., 551 Lytton Ave., Palo Alto, Calif., Health Nurse, Stanford Univ.  
Donald B. McMullen, Sc.D., 801 E. 13th St., Oklahoma City, Okla., Assoc. Professor, Dept. of Hygiene and Public Health, Univ. of Oklahoma School of Medicine  
Dr. Manuel Gonzales-Rivera, Av. El Euzkara 85, Colonia Industrial, Mexico City, Mexico, Supervisor General, Dept. de Salubridad Publica  
Adele P. Schlosser, B.A., 839 Howard Ave., New Haven, Conn., Student, Yale School of Public Health  
Rachel E. Spinney, M.S.P.H., 65 Wethersfield Ave., Hartford, Conn., Health Education Secretary, Hartford Tuberculosis and Public Health Society

#### *Epidemiology Section*

- Martin D. Baum, D.V.M., 116 Temple St., Los Angeles, Calif., City Veterinarian and Director of Milk and Meat Inspection, City Health Dept.  
Lt. Commdr. James E. Fetherston, M.C., U. S. N., U. S. S. Seattle, Navy Yard, Brooklyn, N. Y.  
John B. Gerberich, M.A., 2350 Fourth St., Cuyahoga Falls, Ohio, Laboratory Asst. in Bacteriology, Kent State Univ.  
John S. Kitching, M.D., D.P.H., 453 W. 12th Ave., Vancouver, B. C., Canada, Epidemiologist and Asst. Senior Medical Health Officer, Metropolitan Health Committee

#### *Unaffiliated*

- Amos H. Englebeck, 1904 First Central Tower, Akron, Ohio, President, Summit County Board of Health

## EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York, N. Y.

### U. S. CIVIL SERVICE COMMISSION

The Commission has announced unassembled examinations for Junior Public Health Nurse at \$1,800 a year and Junior Graduate Nurses at \$1,620 a year, under which the training and age requirements of announcements No. 88 and 103 of 1941 have been amended. Persons interested should communicate with the U. S. Civil Service Commission in Washington or obtain the amended announcements at any first or second class post office.

### PHYSICIANS NEEDED IN CANAL ZONE

The U. S. Civil Service Commission announces an examination to secure physicians for clinical service in the Panama Canal Zone. Graduation from a class A medical school subsequent to May 1, 1920, is required, and the applicant must be under 50, 25 to 35 years of age preferred. Entrance salary \$4,000. Persons interested should communicate with the U. S. Civil Service Commission, Washington.

### POSITIONS AVAILABLE

Physician with either public health training or experience in local health department administration to serve as health director in a county health department in mid-western state. Salary \$4,000 and \$500 travel (flat rate). Well established department with offices in attractive little city of 10,000. Write Box T, Employment Service, A.P.H.A.

Wanted: Trained Public Health Nurse, starting salary \$1,500 per year and traveling expense, increase to \$1,620 within 6 months. Saginaw County Health Dept., Saginaw, Mich.

Western state department of health will consider applications from physicians to fill four existing vacancies among county health officers, one vacancy in venereal disease control and positions as laboratory technicians. Write Box S, Employment Service, A.P.H.A.

County Public Health Nurses for New Mexico. Must have four months' post-graduate instruction under one of the recognized public health nursing courses and one year's experience. Must drive and have a car. Address inquiry to State Health Department, Santa Fe, N. M.

### PUBLIC HEALTH ENGINEER

Responsible professional public health engineering involving field investigations and office studies in the application of

sanitary measures. The more difficult engineering and sanitation field surveys include supervision over public water supplies, sewerage systems and sewage treatment plants and review of plans for same, and promotion and supervision of sanitation programs. Minimum qualifications: Training and experience equivalent to 3 years' civil engineering experience, including 2 years in public health or sanitary engineering; or completion of an academic year of graduate study and a year's experience in sanitary or public health engineering; and graduation from a college of recognized standing with a major course in civil or sanitary engineering. The salary range is \$205 to \$250 per month depending upon experience. Apply Box E, Employment Service, A.P.H.A.

### OTHER VACANCIES

Southwestern state health department seeks 2 physicians for assignment to district health units, personally to conduct several small venereal disease clinics on a rotating schedule. Experience preferred but not required. Salary \$3,000, plus actual travel allowance not to exceed \$1,200. Write Box V, Employment Service, A.P.H.A.

The New Mexico State Department of Public Health will consider applications for the position of Assistant Director of the Maternal and Child Health

Division. Address inquiries to the State Department of Public Health, Santa Fe, N. M.

Wanted: Trained Public Health Nurse, starting salary \$1,500 per year and traveling expenses. Increase may be expected within 6 months. Shiawassee County Health Department, Corunna, Mich.

Sanitarian Wanted: Starting salary \$1,800 per year with travel allowance of \$50 per month. Man must have his own car. Bachelor's degree followed by at least one year's course or its equivalent in subjects necessary for one entering the public health field, or an engineering degree plus one year's experience in sanitary or public health engineering required.

A course in public health training may be considered as an equivalent for a part of the experience requirement. Apply Director District Department of Health No. 6, Central Office, Newberry, Mich.

Wanted: Nurse for county health work. Salary \$1,800 per year with travel allowance (additional) of \$500 per year. Address District Health Department 2, West Branch, Mich.

Instructor in Bacteriology, Medical School, large midwestern university, M.D. (or Ph.D. or D.Sc. in Bacteriology); Male. Salary \$1,800 to \$2,500 according to age and experience. Write Box D, Employment Service, A.P.H.A.

## POSITIONS WANTED

### ADMINISTRATIVE

Teaching or administrative position desired by physician, aged 48. Experienced teacher in preventive medicine and public health, now employed at prominent medical school; 20 years' experience in municipal health administration and epidemiology. A-491

Physician, B.S., M.D., and M.S.P.H., University of Michigan, aged 35, experienced city-county health administration and as director university student health service. Will consider permanent responsible position offering good income. A-492

Physician with 25 years full-time experience in public health administration is available for immediate appointment. Moderately hard of hearing; otherwise fully able. Salary \$4,500 or better. A-497

### WOMEN PHYSICIANS TRAINED IN PUBLIC HEALTH

Woman aged 34, M.D., University of Basle, Switzerland, M.S.P.H. DeLamar Institute, Columbia University. U. S. citizen. Excellent references. Especially interested in industrial hygiene. A-493

Woman aged 41, M.D. Columbia University, M.S.P.H. DeLamar Institute, experienced in epidemiology and research, seeks position offering administrative experience. A-494

Woman physician, aged 48, M.D., University of Vienna. Excellent European pediatric experience. Seeks position in pediatrics, administration or statistical research. A-495

### HEALTH EDUCATION

Health Educator, Negro, man with background of High School administration and M.S.P.H. from University of Michigan, seeks position in Health Education. Public agency or educational field. Excellent references. H-497

Health Educator, M.A. in Education, 10 years' background in community organization for public health education, also teaching of personal and community health at high school and college levels. Public health nurse, able to teach mental and social hygiene as well as general health education. East preferred. H-498

Teacher and research worker, man, Ph.D., age 52. Extensive record as college professor of biology and hygiene and investigator, for the past two years engaged in research. H-499

Health Educator. Man with M.S. in preventive medicine and public health. Negro. Seeks position in Health Education or field work with official or non-official agency. H-500

Woman with master's degree in health education, 12 years' successful experience in public school and college teaching, administration and research. Will consider position in normal school, public schools, or in official or nonofficial health agencies. Prefers South or East. Available at once. H-501

### LABORATORY

Milk Sanitarian and Technologist, age 37, Ph.D., Bacteriology, Wisconsin, 10

years' experience in milk and food sanitation from industrial and official angle, seeks administrative position with opportunity for research or investigational work preferred. L-381

Chemist, Sc.D., Biochemistry, Johns Hopkins University. Age 31. Public health laboratory experience, teaching experience. Desires position with promise of advancement, preferably in commercial organization. L-461

Bacteriologist, young man 28, with B.S. in industrial science, experienced in newspaper work, salesmanship and now employed in state department of health laboratory, seeks position as bacteriologist or doing promotional work of public health nature. L-465

## MISCELLANEOUS

Well trained ophthalmologist desires position in public health work. M-450

Veterinary Doctor, M.P.H., University of Pennsylvania, age 27, with two years of practice, seeks position in food, meat, milk, or livestock sanitation with state or local health department. Also interested in teaching position with research facilities. M-451

Public Health Nurse with M.A. degree wishes position in health supervision and teaching in college or public school. West preferred. M-452

Administrative Assistant or Health Educator, woman, M.A. 10 years' experience in health agency offices; 7 years' teaching experience; writer on health and other subjects; experienced in independent research; some training in social work; some hospital experience. M-453



## NEWS FROM THE FIELD

### THE NUTRITION FOUNDATION AWARDS GRANTS

THE Nutrition Foundation announces that grants for \$125,000 have been awarded for fundamental research in the science of nutrition.

Dr. Karl T. Compton, Chairman of the Board of Trustees of the Foundation, who is also President of Massachusetts Institute of Technology, said that in making these independent research studies possible for the public welfare, the members of the food and related manufacturers, acting together through the Foundation, were opening a new frontier of public service.

George A. Sloan, President of the Foundation, announced the election of the National Dairy Products Corporation as a founder member, and the election of their President, L. A. Van Bomel, a member of the Board of Trustees. Dr. Lloyd K. Riggs of National Dairy Products, and Dr. J. T. Knowles, in charge of the Chicago Laboratory of Libby, McNeill & Libby, were appointed members of the Food Industries Advisory Committee.

Dr. Compton said the Board had considered a large group of applications with reference to three primary objectives, which the Board wishes particularly to support under present conditions:

*First:* Their contribution to our war effort;

*Second:* Their immediate advantage to public health;

*Third:* Their long time advancement of the fundamental science of nutrition—the kind of exploratory research that will lay the foundation for better health and scientific guidance in the food industry of tomorrow.

To date, 22 universities have received grants.

Grants were also made to the Children's Fund of Michigan, Detroit, Mich., the Food and Nutrition Board of the

National Research Council, Washington, D. C., and to the New York State Agricultural Experiment Station, Geneva, N. Y.

### UNIVERSITY OF MINNESOTA ENGINEERING COURSE

AN intensive course in public health engineering will be offered at the University of Minnesota under the auspices of the Department of Preventive Medicine and Public Health. This course, which will run from June 15 to August 28, 1942, will bring together in an 11 weeks' term several of the fundamental courses in the regular public health engineering curriculum leading to a master's degree. All courses will be of usual academic quality, and credit so earned will count toward a degree. The courses will consist of lectures, conferences, laboratory exercises, and field demonstrations. The facilities of the Division of Sanitation in the Minnesota Department of Health, as well as of local health departments, will be utilized for student teaching.

Registrations will be limited to graduates in engineering or persons who have had suitable experience in the field of environmental sanitation. All inquiries should be directed to the Department of Preventive Medicine and Public Health, University of Minnesota, Minneapolis, Minn.

### MALARIA IN NICARAGUA

PRESS reports in May indicated that Dr. Luis M. DeBayle, the chief medical officer of the Nicaraguan Army and Director of Public Health, has instituted a campaign against malaria as the number of deaths has increased 30 per cent in the past year. Dr. DeBayle was a guest of the American Public Health Association at the 70th Annual Meeting in Atlantic City.

PUBLIC HEALTH ASSOCIATION OF  
NEW YORK CITY

THE Public Health Association of New York City held its Sixth Annual Meeting at Hotel George Washington in the Borough of Manhattan on May 13.

The proceedings opened with a panel discussion in the afternoon the theme of which was "Public Health, Social and Legal Problems Connected with Prostitution." Participants in the discussion were the following: Ruth Collins, Superintendent, House of Detention for Women; Dr. Roger E. Heering, Passed Assistant Surgeon, U. S. Public Health Service; Patrick J. Shelly, Chief Officer, Probation Bureau, Magistrates' Courts; Honorable Jeanette G. Brill, former City Magistrate; and Dr. Thomas A. Storey of the American Social Hygiene Association. The moderator of the panel was Dr. Jacob A. Goldberg, Executive Secretary, Social Hygiene Committee of the New York Tuberculosis and Health Association. The audience participated in the discussion.

The following officers were elected to serve until the Annual Meeting in 1943:

*President*—Helen C. Manzer, Ph.D.

*First Vice-President*—George T. Palmer, Dr.P.H.

*Second Vice-President*—Alfred E. Shipley, M.D.

*Secretary-Treasurer*—Frank Kiernan

New members of the Executive Board were elected as follows:

Arthur I. Blau, M.D.

James M. Dunning, M.D.

J. Leon Lascoff, M.D.

Pauline Murrah

John L. Rice, M.D.

James A. Tobey, Dr.P.H.

Sol Pincus, Deputy Commissioner of Health of the City of New York, was elected as representative to the Governing Council of the American Public Health Association. The Secretary reported that the membership numbered 282.

TRAVELING EXHIBIT—FOOD FOR  
HEALTH

BRUNO GEBHARD, M.D., Director of the Cleveland Health Museum, has announced that the following exhibits are available for loan purposes, and the Museum will also make duplicates for any organization or institution wishing to purchase them. Prices for duplicates will be quoted on request.

Protective Foods (Eat Every Day)—No. 101

How Many Calories? (Caloric Value of Favorite Foods)—No. 102

What Do We Need for Work and Play?—No. 103

Why We Eat—No. 105

Food Building Blocks—No. 106

A Nickel's Worth—No. 109

Foods, Facts, and Fallacies (Food Lie Detector)—No. 110

Double Your Food Value for the Same Price—No. 111

The Normal Diet Must Stand 4 Square—No. 115

Since the Museum has no endowment for such loan exhibits, a rental charge of \$5.00 per single unit per week, including time for transportation, must be made.

Units No. 103 (What Do We Need for Work and Play) and No. 105 (Why We Eat) are considered as *double* units, but separate sections may be borrowed as single units.

All exhibits are sent express collect and must be returned prepaid.

Special arrangements can be made for longer periods of time, and for the use of more than one unit.

SAVANNAH DEDICATES NEW MUNICIPAL  
HEALTH CENTER

A NEW Municipal Health Center Building was dedicated in Savannah, Ga., on March 25. The three story building, recently completed as a joint city-WPA project, at a cost of \$100,000, houses all of the official and nonofficial health agencies incorporated into the organization known as the Savannah Health Center, directed by the City and

County Health Department, of which Charles C. Hedges, M.D., is director. Those participating included Mayor Gamble of Savannah, who reviewed progress made in the field of health services in the city since the appointment of the first health officer in 1790; Allen H. Bunce, M.D., President, Medical Association of Georgia; Monroe J. Epting, M.D., past President of the Savannah Health Center; and A. J. Waring, M.D., President of the Savannah Health Center. The principal address, "The Health Center and the Health Officer," was delivered by Dr. Harry Stoll Mustard, Director of the DeLamar Institute of Public Health, Columbia University, New York, N. Y.

#### AWARD OF THE CHANDLER MEDAL OF COLUMBIA UNIVERSITY

FOR outstanding achievements in chemical science Dr. Robert R. Williams of the Bell Telephone Laboratories, New York, N. Y., and his brother, Dr. Roger J. Williams, of the University of Texas, received recently awards of the Charles Frederick Chandler Medal of Columbia University. This medal was established in 1910 in honor of the chemistry professor of Columbia whose name it bears who was one of the founders of the American Public Health Association.

The award to Dr. Robert R. Williams was for his years of work on the isolation of vitamin B<sub>1</sub> and his contributions to the elucidation of its chemical structure. The award to Professor Roger J. Williams was made in recognition of his discovery of pantothenic acid, a powerful regulator of growth, and for his contributions to the knowledge of the vitamin B complex.

#### TALKS TO THE PUBLIC ON GONORRHEA

MANY physicians will be called upon to give information before groups on gonorrhea. The emphasis placed on eradication of this disease by

official agencies such as the U. S. Public Health Service, and the New York City Health Department will cause lay groups to schedule lectures. Of course, the physicians known to the officers and members will be invited. What to say? Some hints as to the approach to the public health aspects of gonorrhea as a problem for the individual and for the community were given in recent radio talks over WYNC by Herman Goodman, M.D., under the auspices of the Bureau of Health Education and the Bureau of Social Hygiene of the New York City Health Department. Copies of these talks may be obtained by writing to Director, Bureau of Health Education, 125 Worth Street, New York, N. Y., or to Station WNYC. There is no charge.

#### CHARLESTON COUNTY HEALTH OFFICER

THE Legislature of South Carolina recently enacted a law requiring that the Health Officer of Charleston County be elected with the other county officers instead of being appointed by the County Board of Health. The Medical Society of South Carolina has adopted a resolution expressing "unqualified condemnation" of the requirement.

#### CENSUS DATA ON SEWERAGE SYSTEMS

THE *Summary of Census Data on Sewerage Systems* appearing in *Public Health Reports*, Volume 57, No. 12, March 20, 1942, pp. 409-421, is available for general publication, though at present reprints are not available.

The material from which the summary was prepared is also available in mimeographed form arranged by states and lists basic data on sewerage systems including detailed information on the rated capacity and methods of treatment of each individual plant and also on the population served (1940), date of installation, volume of sewage treated, populations contributing untreated sewage discharged by individual communi-

ties, and the bodies of water into which both treated and untreated sewage is discharged. A similar census of water treatment plants is now in preparation and will be available in the near future. —From Stream Pollution Investigations, U. S. Public Health Service, East Third and Kilgour Streets, Cincinnati, Ohio

#### ON MILITARY LEAVE FROM THE ILLINOIS DEPARTMENT OF PUBLIC HEALTH

ON military leave from the Illinois Department of Public Health are Richard Baxter, Vivian Clarke, R.N., Arnold M. Cohn, M.D., Theodore Cohn, Benedict Corsiglia, Cecil Curtwright, William Dietch, Harold S. Duhamel, Leonard Dworsky, George L. Farnsworth, Harry S. Fein, M.D., M. R. Golly, William A. Hasfurther, William Honsa, Robert E. Hunt, M.D., Paul M. Kiel, Raymond I. Leland, Robert Lynskey, Harold McCormick, C. H. Miller, M.D., Douglas B. Morton, R. S. Nelle, C. L. Nelson, Daniel O'Connell, E. J. Olenick, M.D., Thomas E. Philbin, Carl W. Reh, Walter H. Rieger, Reno Rosi, M.D., Jack G. Sieg, J. F. Shronts, M.D., H. J. Spaeder, and Loren Woodman.

#### NEW YORK STATE DEPARTMENT OF HEALTH PERSONNEL CALLED FOR MILITARY DUTY

MEMBERS of the Medical and Sanitary Engineering staffs of the New York State Department of Health who have recently been called for military duty are listed below, together with the date of commencement of such duty. These are in addition to those whose names were listed in the May JOURNAL.

John E. Kiker, Jr., Assistant Sanitary Engineer, May 13, 1942  
Charles Lose, Junior Sanitary Engineer, April 15, 1942  
Joseph Salvato, Junior Sanitary Engineer, April 15, 1942  
William Smith, M.D., Assistant District Health Officer, May 15, 1942

#### PUBLIC HEALTH SERVICE LOANS PERSONNEL TO NEW YORK STATE

THE New York State Department of Health announces that three additional physicians and one sanitary engineer have been loaned to the department by the U. S. Public Health Service.

##### Physicians

Morris J. Stone, M.D., assigned to the Division of Syphilis Control

Abe L. Scheff, M.D., assigned to the New York office of the Health Preparedness Commission

George Alpert, M.D., assigned to the Gouverneur district office

##### Sanitary Engineer

Arthur Wallach, assigned to the Syracuse branch office.

#### WEST VIRGINIA PUBLIC HEALTH ASSOCIATION

AT its recent Annual Meeting, the West Virginia Public Health Association elected the following officers to serve for the next year:

President—Norman G. Angstadt, M.D., Fayetteville

1st Vice-President—Alice Duff, Morgantown

2nd Vice-President—O. R. Lyons, Beckley

Secretary-Treasurer—Dorothea Campbell, Charleston

#### HOWARD TAYLOR RICKETTS PRIZE

THE Howard Taylor Ricketts Prize of the Division of the Biological Sciences of the University of Chicago, according to *Science*, has been awarded to Dr. Jose Oliver-Gonzalez, a Puerto Rican by birth, Research Associate at the university, in recognition of his work indicating that trichinosis is caused by two forms of parasite and therefore immunity to the disease can be produced only by the formation of two antibodies. The prize was established in 1913 in honor of Dr. Howard Taylor Ricketts of the University of Chicago, who discovered the cause of Rocky Mountain spotted fever. He died in 1910.

THE KELLOGG FOUNDATION'S CONTRIBUTION TO PUBLIC HEALTH IN THE EMERGENCY

THE Kellogg Foundation has announced a plan whereby it will assist students of limited means in public health, medical, dental, and nursing schools to continue their studies during the emergency. The accelerated programs of study in many schools have brought new responsibilities to students who have heretofore depended on vacation and other earnings to help defray the cost of their studies.

Discussions held at a recent meeting of the Association of Schools of Public Health and individual conferences with deans have made it clear that the need exists both for scholarships and for loan funds for students of public health and others.

The Foundation has offered to nearly one hundred and fifty schools of public health, dentistry, medicine, and nursing in this country and Canada the sum of \$10,000 a year in the nature of a gift to each school that wishes to accept it. The funds granted will not be returned. If loan funds are set up by the schools, payments will be made to the school, thus providing a continuing or revolving fund.

The matter of scholarships will be left entirely in the hands of the school. The Foundation will have nothing to do with the selection or approval of the candidates but expects that scholarships will be granted on the basis of scholastic ability, character, and need in comparison with other applicants. It is the hope of the Kellogg Foundation that money so used will be chiefly for the purpose of encouraging exceptional students otherwise unable to enter the field of public health. The only restriction specified is that the scholarships for public health students shall not amount to more than \$800 to any one student in one year.

The Kellogg Foundation is to be

commended for this splendid contribution to public health and related sciences in the war effort. The public health profession can indeed be gratified with this sympathetic understanding of its urgent needs.

THIRTEENTH ANNUAL MEETING OF THE WESTERN BRANCH, A.P.H.A.

THE 13th Annual Meeting of the Western Branch was held in Seattle, Wash., May 26-29.

The following officers were elected for 1942-1943:

*President*—Donald G. Evans, M.D., Seattle, Wash.

*President-elect*—Karl F. Meyer, M.D., San Francisco, Calif.

*Secretary*—W. Ford Highby, San Francisco, Calif.

*Treasurer*—Guy S. Millberry, San Francisco, Calif.

MISSOURI PUBLIC HEALTH ASSOCIATION

ON May 7 to 9 the Missouri Public Health Association held its Eighteenth Annual Meeting in Kansas City. Approximately 500 members and guests attended the meeting which consisted of general sessions and sectional meetings for health officers, engineers and sanitary officers, public health nurses, and vital statisticians.

The following officers were elected for the ensuing year:

*President*—Stephen J. Wolff, St. Louis

*President-elect*—E. A. Belden, M.D., Sikeston

*Vice-President*—Hugh L. Dwyer, M.D., Kansas City

*Secretary-Treasurer*—Glen J. Hopkins, Jefferson City

MISSISSIPPI NUTRITION COURSES

THE State Extension Service and the Department of Home Economics of the Mississippi State College, State College, Miss., through the State Nutrition Committee, are sponsoring a series of 3 one day nutrition meetings for three successive months in all the counties of the state.

## PERSONALS

## Central States

CHARLES F. ABELL, M.D., of Marion, Ind., has been named City Health Officer.

MARVIN F. HAYGOOD, M.D., formerly of the Iowa State Department of Health, has been appointed Chief of the Illinois Division of Local Health Administration, effective July 1.

RICHARD F. BOYD, M.D.,\* has returned to Illinois from Topeka, Kans., to serve as Assistant to the Chief of this Division.

ALBERT B. HEADLEY, M.D., of Cambridge, Ohio, has been appointed Health Commissioner of Guernsey County, succeeding MARSHALL J. THOMAS, M.D., of Cambridge, resigned.

ALBERT J. HELM, M.D., of London, Ohio, Health Officer of Madison County, has been given jurisdiction over the unit in Union County under a recently adopted plan merging the two units.

WILLIAM E. HOLMES, M.D., of Omaha, Neb., has been added to the Nebraska State Health Department staff as Medical Health Officer.

HUGO V. HULLERMAN, M.D.,† for 2 years Chief of the Illinois State Division of Local Health Administration, is accepting a position July 1, with the Peoria Department of Public Health as Deputy Commissioner and Director of Maternal and Child Hygiene.

WILLIAM E. JENKINSON, M.D., of Mount Vernon, Ind., has been appointed in charge of the Posey County Health Unit.

THADDEUS M. KOPPA, M.D., C.P.H.,† Assistant Director of Epidemiology, Michigan State Department of Health, Lansing, Mich., has been appointed Director. He succeeds WALLACE M. CHAPMAN, M.D.† who

has resigned to enter private practice in California. Dr. Chapman was named to the position last year.

PAUL E. LANDIS, Associate Professor of Physical Education at Bowling Green State College, Bowling Green, Ohio, has been named State Supervisor of Health, Physical Education, Recreation and Safety, effective March 1. This position was created within the Department of Education to cooperate with federal defense agencies.

CARL B. MCCORD, M.D., of Veedersburg, Ind., is the new Health Officer in Fountain County.

ALLAN J. McLAUGHLIN, M.D.,\* Passed Assistant Surgeon General, and recently of the Michigan School of Public Health, is now serving the Illinois Department of Public Health, Springfield, Ill., as Medical Administrative Consultant.

CLARENCE B. RAWERS, M.D., of Bergholz, Ohio, has been appointed Health Commissioner of Jefferson County.

IRA LEO SCHAMBERG, M.D., formerly Research Associate in Dermatology and Syphilology at the University of Michigan, Ann Arbor, has been appointed Supervisor of Venereal Disease Control in the Louisiana State Health Department, New Orleans.

SUE HURST THOMPSON, M.D.,† of West Branch, Mich., has resigned as Director of District Health Unit No. 2, comprising the Counties of Ogemaw, Oscoda, Iosco, and Alcona. HAROLD W. SEFF, M.D.,† of West Branch, is the Acting Director, pending a permanent appointment in June.

WILLIAM ROBERT TIPTON, M.D., of Greencastle, Ind., has been appointed in charge of the Health Unit in Putnam County.

FRED O. TONNEY, M.D.,† of Escanaba, Mich., is Director of the new Delta County Health Center at Escanaba.

FRANKLIN H. TOP, M.D.,\* of Detroit, has been appointed by the Detroit

\* Fellow A.P.H.A.

† Member A.P.H.A.

Board of Health as Medical Director of the Herman Kiefer Hospital, Detroit.

VERNON M. WINKLE, M.D., of Norfolk, Neb., has been named Director of Health Unit Number 1, covering Scottsbluff, Morrill, and Banner Counties; and Temporary Director of Health, of Unit Number 3, comprising Lincoln and Keith Counties.

ELIZABETH I. WORKMAN, M.D., of Columbus, Ohio, has been named Health Commissioner of Delaware County, filling the unexpired term of GEORGE FREDERICK MOENCH, M.D.,† who went to the W. K. Kellogg Foundation in Michigan.

#### Eastern States

AUGUSTUS J. HAMBROOK, M.D., of Troy, N. Y., has been appointed Medical Consultant in the Troy Department of Public Welfare, a new position provided for in the 1942 city budget, effective January 1.

REUBEN MUTNICK, M.D.,† of New York, N. Y., has been named Director of the Dodge-Saunders defense area, Nebraska.

JOSEPH SHILEN, M.D.,† of Pittsburgh, Pa., has been appointed head of the Division of Industrial Hygiene of the Pennsylvania State Department of Health, Harrisburg. He succeeds WILLIAM B. FULTON, M.D., M.P.H.,\* of Harrisburg, who was appointed Chief of the Division of Health of the U. S. Bureau of Mines.

#### Southern States

BURTON F. AUSTIN, M.D.,† of Montgomery, Ala., has been named State Health Officer, to succeed the late JAMES N. BAKER, M.D.,\* of Montgomery. Dr. Austin has been Acting Health Officer. In 1935 he was named Director of the State Bureau

of Hygiene and Nursing, now the Bureau of Maternal and Child Health, a position he held at the time of Dr. Baker's death last November.

JESSIE M. BIERMAN, M.D., M.P.H.,\* has resigned from the staff of the Children's Bureau, Washington, D. C., to accept appointment as Chief of the Division of Maternal and Child Health of the California State Department of Health, San Francisco.

REVIS A. BRANNON, JR., M.D., of Utica, Miss., has been named Director of the Southeastern Health District covering George, Green, Stone, and Perry Counties.

CAROLINE H. CALLISON, M.D., of Chatham, Ala., has been named Health Officer of Coosa County, to succeed WILLIAM H. GOFF, M.D., of Rockford, who resigned to enter private practice.

ROBERT L. CHERRY, M.D., M.P.H.,\* has resigned as Field Director of Local Health Service, Texas State Department of Health, to accept the position of Director of the Harris County Health Unit, Houston, Tex.

JOHN COLLINSON, JR., M.D., DR.P.H.,\* of Baltimore, Md., has been appointed Health Officer of Cecil County, filling the unexpired term of the late CLINTON A. KANE, M.D.,\* Perryville, Md.

JOHN W. DABBS, M.D., formerly Health Officer of Geneva County, Ala., has been named Health Officer of the Oktibbeha County Health Department at Starkville.

GEORGE A. DENISON, M.D.,\* Acting Health Officer of Birmingham and Jefferson County, Ala., since September, has been appointed Health Officer, effective February 25.

LOYAL D. FARRAGUT, M.D., of Jackson, Tenn., has resigned as Director of the Madison County Health Unit, to enter Army service.

VERNON W. FOSTER, M.D., of Savannah, Ga., has been placed in charge

\* Fellow A.P.H.A.

† Member A.P.H.A.

of the newly created Health Unit of Henry County.

VICTOR P. GENGE, M.D., is the new Director of the Lafayette County Health Department, succeeding THOMAS L. OWINGS, M.D., of Oxford, who resigned to enter private practice in Alabama.

DR. WILLIAM E. GRAHAM, formerly with the U. S. Public Health Service, has been appointed Director of the Division of Venereal Diseases of the District Health Department, effective February 5.

JOSEPH HIRSH,† until recently in charge of health and welfare planning with the Federal Public Work Reserve, Washington, D. C., has been appointed Liaison Officer in the Executive Office of the President, Office of Government Reports, Washington.

ISAAC N. JONES, M.D., of Greensboro, Ala., has been appointed in charge of the Hale County Health Unit, succeeding ELDRIDGE T. NORMAN, M.D., of Greensboro, who resigned to resume private practice.

WILLIAM E. MCILVAIN, M.D., of Charleston, W. Va., Director of the Bureau of Tuberculosis of the State Health Department and for the past 2 years in charge of the State's Mobile X-ray Unit, resigned, April 6, it is reported, to enter the U. S. Navy.

THOMAS B. MCKNEELY, M.D., Passed Assistant Surgeon of the U. S. Public Health Service, Washington, D. C., has been assigned to the Medical Division, Office of Civilian Defense, for duties in connection with the organization of emergency medical services.

JOE H. PRICE, M.D., formerly District Health Officer, McLeansboro, Ill., has been appointed Health Officer of Tishomingo County, succeeding WILLIAM R. ARMSTRONG, M.D., of Iuka, who has entered Army service.

SHALER A. RICHARDSON, M.D., of Jacksonville, Fla., has resigned as a member of the State Board of Health, to devote his time to private practice and to his duties as Secretary-Treasurer of the Florida Medical Association.

STARLING D. STEINER, M.D.,† of Baltimore, Md., has been appointed Chief of the Division of Industrial Health of the Maryland State Department of Health. Dr. Steiner has recently been a member of the U. S. Public Health Service staff.

THOMAS B. TURNER, M.D.,\* Professor of Bacteriology, Johns Hopkins University School of Hygiene and Public Health, Baltimore, Md., and Lieutenant Colonel in the Medical Reserve Corps of the U. S. Army, has been called into active service as Chief of the Subdivision of Venereal Disease Control in the Surgeon General's Office.

#### DEATHS

WILLIAM HENRY BEST, M.D.,\* Deputy Commissioner of the Department of Health of New York City, died June 3, at the age of 57.

JAMES D. TRASK, M.D.,† Associate Professor of Pediatrics, Yale School of Medicine, New Haven, Conn., died May 24, in Chicago, Ill., at the age of 51. Dr. Trask had been working as a consultant to the Secretary of War on epidemic diseases, with the aid of staff members of the Yale School of Medicine. On April 22, he and his colleague at Yale, JOHN R. PAUL, M.D.,† Professor of Preventive Medicine, received the John Phillips medal of the American College of Physicians for their research on infantile paralysis. Dr. Trask was graduated from the Sheffield Scientific School at Yale in 1913 and received an M.D. from the Cornell Medical School in 1917.

\* Fellow A.P.H.A.

† Member A.P.H.A.



## CONFERENCES AND DATES

American Chemical Society—National Chemical Exposition, National Industrial Chemical Conference. Stevens Hotel, Chicago, Ill. November 17-22.

American College of Surgeons—Clinical Congress. 32nd Annual. The 25th Annual Hospital Standardization Conference, sponsored by the College, will be held simultaneously. Stevens Hotel, Chicago, Ill. October 19-23.

American Congress of Physical Therapy—21st Annual Scientific and Clinical Session. Hotel William Penn, Pittsburgh, Pa. September 9-12.

American Hospital Association. St. Louis, Mo. October 12-16.

American Public Health Association—71st Annual Meeting. Headquarters, Municipal Auditorium, St. Louis, Mo. October 27-30.

American Public Works Association. Cleveland, Ohio. October 18-21.

American Society of Civil Engineers—Summer Meeting. Upper Mississippi. July. Fall Meeting. New England. October.

American Water Works Association—Michigan Section—Park Place Hotel, Traverse City, Mich. September 9-11.

Rocky Mountain Section—Frontier Hotel, Cheyenne, Wyo. September 17-18.

Western Pennsylvania Section—Roosevelt Hotel, Pittsburgh, Pa. September 18.

Minnesota Section—Lowrey Hotel, St. Paul, Minn. September 24-26.

Four States Section—Benjamin Franklin Hotel, Philadelphia, Pa. October 7-9.

Southwest Section—Little Rock, Ark. October 12-15.

Kentucky-Tennessee Section—Irving Cobb Hotel, Paducah, Ky. October 19-21.

Missouri Valley Section—Coronado Hotel, St. Louis, Mo. October 22-24.

California Section—Hotel Oakland, Oakland, Calif. October 28-30.

North Carolina Section—Washington Duke Hotel, Durham, N. C. November 2-4.

Civil Service Assembly—Annual Conference. St. Paul, Minn. October 1-3.

Conference on Human Development and Education—sponsored by the University of Chicago, the Commission on Teacher Education, and the Department of Supervisors and Directors of Instruction. University of Chicago, Chicago, Ill. August 10-21.

Federation of Sewage Works Association. Cleveland, Ohio. October 15-17.

Indiana State Medical Association—93rd Annual Session. French Lick, Ind. September 29-October 1.

International Association of Milk Dealers. Peabody Hotel, Memphis, Tenn. October 22-24.

Michigan Public Health Association. Grand Rapids, Mich., November 11-13.

National Association of Public School Business Officials. Cleveland, Ohio. October 5-8.

National Association of Social Workers—Delegate Conference. October.

National Education Association. Denver, Colo. June 27-July 2.

National Probation Association. Asheville, N. C. October 19-23.

National Recreation Association. Cincinnati, Ohio. September 28-October 2.

National Safety Council. Chicago, Ill. October 5-9.

New Mexico Public Health Association. Raton, N. M. October.

New York State Association of Milk Sanitarians—20th Annual Conference. DeWitt Clinton Hotel, Albany, N. Y. September 23-25.

Tennessee Public Health Association. Nashville, Tenn. September.



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# American Journal of Public Health

## and THE NATION'S HEALTH

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### The Epidemiology of Syphilis Based Upon Five Years' Experience in an Intensive Program in New York State\*

WILLIAM A. BRUMFIELD, JR., M.D., JAMES H. LADE, M.D.,  
AND LOUIS L. FELDMAN

*New York State Department of Health, Albany, N. Y.*

CLINICAL and laboratory studies of syphilis have given us certain basic knowledge regarding the disease in individuals which, applied to the disease in the population at large, will bring about a reduction in its prevalence if not its ultimate eradication. These facts are: that syphilis is readily transmitted from person to person and rarely by other means; that infectiousness is limited to the relatively early case except in pregnancy, during which transmission of the infection may occur even after many years; that modern anti-syphilitic treatment will render patients temporarily noninfectious promptly and, if continued, will control infectiousness permanently. Obviously the first requisite in planning a program for syphilis control is to have information regarding the disease as a mass phenomenon in

order that these fundamental facts may be utilized most effectively.

Although the value of the individual case report as the basic unit in the collection of morbidity data is well recognized, it is equally well recognized that until recent years at least, syphilis case reporting in the United States has been unsatisfactory. Morbidity reporting has afforded only a partial index of the problem, varying in accuracy from place to place according to the willingness of physicians to report cases voluntarily, and the ability of the health officer to check for completeness of reporting and to procure missing data.

Because syphilis case reporting has been unreliable, it was formerly necessary to resort to other methods for obtaining information concerning the prevalence of this disease. Prior to the advent of the complement-fixation test for syphilis, analyses of records of physicians, clinics and hospitals, and compilation of data from consecutive post-

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\* Read before the Epidemiology Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 15, 1941.

mortem examinations were the only sources of information. The reliability of the data so collected depended entirely upon the proficiency and interest of the attending physician or pathologist. The introduction of the serologic test reduced the inaccuracies in diagnosis considerably and led to the accumulation of fairly accurate information through serologic surveys of various population groups. The one day survey by questionnaire has provided an additional means of determining the extent of the syphilis problem.

Selection is inherent in varying degrees in each of these methods, but despite such limitations information has been thus secured concerning the prevalence of syphilis, focusing attention on the disease as one of the most important public health problems. Beyond this point, however, the value of such surveys diminishes. It is true that repeated surveys by any of these methods will establish the trend of syphilis, but because of the chronicity of the disease the same patients will be recounted, masking to some extent changes in incidence and prevalence. At best they give us information as to what *has* occurred. They cannot be relied upon for current information upon which specific control procedures may be instituted or altered. The development of a method for the prompt and complete collection of accurate case reports is essential if we are to make the best use of the facilities at our disposal.

On January 1, 1936, the New York State Department of Health inaugurated an intensive syphilis control program, one of the objectives of which has been to obtain complete and accurate case reports for all cases of syphilis coming to the knowledge of health officials from any source. With the passing of 1940, 5 years' experience with this program had been completed. It is our purpose here to discuss the prevalence and trend of syphilis, based

on the data accumulated during this period.

#### PROGRAM OF SYPHILIS CONTROL

Inasmuch as the procedures for the control of syphilis affect and are in turn affected by morbidity reporting, it is necessary for the interpretation of morbidity data that we understand the conditions under which these data are collected. Inasmuch as the New York State Syphilis Control Program has been described in detail elsewhere we shall not repeat it here. It is pertinent that every precaution was taken during the period under consideration to secure complete and accurate reporting of cases from clinics and private physicians and to remove duplicates of cases previously reported.

In addition to provisions for complete and accurate case reporting, the objectives of the program have been (1) to provide adequate diagnostic and treatment facilities; (2) to provide adequate facilities for investigations of syphilis cases and contacts; and (3) to promote a program for professional and lay education in modern concepts of syphilis and its control.

We shall not go into details regarding activities. It is significant, however, that from 1936 through 1940, the number of serological tests for syphilis increased more than twice; that the clinic sessions and hours were considerably increased, with a corresponding increase in the quantity and quality of the work performed; that 9 counties adopted a plan for providing treatment by private physicians for cases unable to pay; that the distribution of antisypilitic drugs increased more than 50 per cent; that physicians increasingly took advantage of the facilities for delinquent patient follow-up offered by state and local health departments; and that the consultation service was being used widely by the medical profession. The lay education program reached all parts of

the state, resulting, we believe, in a better public understanding of syphilis than ever before.

#### PREVALENCE OF SYPHILIS IN UPSTATE NEW YORK

During the 5 year period 1936-1940 there were 79,991 cases of syphilis reported in New York State exclusive of New York City (Table 1). Of these, 71,001 were classified as acquired syphilis and 5,880 as congenital. The type of infection was not known in 3,110 patients. Among the cases reported as acquired syphilis 8,194 were classified as early; 62,260 as late, and in 547 patients the stage of the disease was not stated. Thus, 89 per cent of the total cases reported were classified as acquired syphilis, 7 per cent as congenital, and 4 per cent were unclassified as to type. Of the acquired cases, 11 per cent were stated to be early, 88 per cent late, and in 1 per cent the stage of disease was unknown.

The discussion of these cases will be limited to their distribution by age, and according to the sizes of the communities from which they were drawn. Although the prevalence and attack rates were lower in the female than in the male, their distribution by age was essentially the same for both sexes.

Inasmuch as New York State has a relatively small Negro population, concentrated in two metropolitan areas, about Buffalo, and New York City, classification of the cases by color would not change the picture.

In dealing with the acute communicable diseases, the terms "prevalence" and "incidence" are more or less synonymous. In the case of chronic diseases, however, they have distinct meanings. By prevalence, we mean the total number of cases existing at any one time, including newly acquired infections, and those of long duration. Incidence refers to the number of new infections introduced into the population during a period of time contributing to the total prevalence of the disease. These terms will be so used throughout this discussion.

The total number of cases of syphilis reported in New York State (exclusive of New York City), and rates per 100,000 population, grouped according to age, are shown in Table 2. It will be observed that an appreciable number of cases of syphilis were brought under observation during childhood. The rates were higher for those of less than 5 years of age than for the two succeeding groups. Beginning with the age group 15-19 years there was a sharp

TABLE 1

*Reported Syphilis Cases and Rates per 100,000 Population\* by Type of Disease and State of Infection*

*New York State (Exclusive of New York City)*

1936-1940

1936-1940														
Year	Cases							Case Rates						
	Acquired							Acquired						
	Total	Total	Early	Late	Unknown	Congenital	Unknown	Total	Total	Early	Late	Unknown	Congenital	Unknown
Total	79,991	71,001	8,194	62,260	547	5,880	3,110	...	...	...	...	...	...	...
1936	18,244	14,390	2,268	11,709	413	1,291	2,563	310	245	39	199	7	22	44
1937	18,228	16,631	2,128	14,483	20	1,532	65	309	282	36	246	†	26	1
1938	16,558	15,076	1,706	13,340	30	1,339	143	278	254	29	225	†	22	2
1939	14,266	12,995	1,081	11,878	36	1,074	197	238	218	18	199	†	18	3
1940	12,695	11,909	1,011	10,850	48	644	142	210	198	17	181	†	11	3

\* July 1 estimate based on 1940 census

† Less than 1 per 100,000 population

TABLE 2

*Total Reported Syphilis Cases and Rates per 100,000 Population\* by Age Group  
New York State (Exclusive of New York City)  
1936-1940*

Age Group	Cases						Case Rates				
	Total	1936	1937	1938	1939	1940	1936	1937	1938	1939	1940
Total	79,991	18,244	18,228	16,558	14,266	12,695	310	309	278	238	210
<i>Years</i>											
Under 5	1,119	295	252	227	216	129	76	65	58	55	32
5-9	669	169	170	118	121	91	40	40	28	28	21
10-14	877	225	245	156	139	112	48	52	33	29	23
15-19	2,745	668	671	559	476	371	132	132	109	92	72
20-24	7,495	1,938	1,701	1,506	1,260	1,090	397	346	304	253	218
25-29	9,943	2,303	2,440	2,040	1,735	1,425	513	540	449	379	310
30-34	9,808	2,221	2,253	2,066	1,741	1,527	495	499	455	381	332
35-39	9,492	2,120	2,240	1,938	1,718	1,476	472	496	426	376	321
40-44	8,800	1,959	2,121	1,819	1,457	1,444	436	470	400	319	314
45-49	7,547	1,599	1,758	1,562	1,360	1,268	375	410	362	311	290
50-54	7,066	1,369	1,651	1,523	1,345	1,178	369	442	406	401	310
55-59	4,890	901	1,005	1,134	942	908	309	343	384	315	304
60+	7,748	1,341	1,523	1,724	1,580	1,580	184	207	233	212	211
Unknown	1,792	1,136	198	186	176	96	...	...	...	...	...

\* July 1 estimate based on 1940 census

rise in the prevalence rates, reaching a peak in 1936 and 1937 in the age group 25-29 years, flattening off in 1938-1939 to a peak between 25 and 34 years, and resulting in a definite peak at 30-34 years in 1940. Following the peak prevalence, there was a gradual decline in prevalence rates up to 50-54 years, when in 1936 there was a deceleration of the decline, and in the succeeding 4 years an actual increase in prevalence rates in this group, followed by an uninterrupted decline in the older age groups.

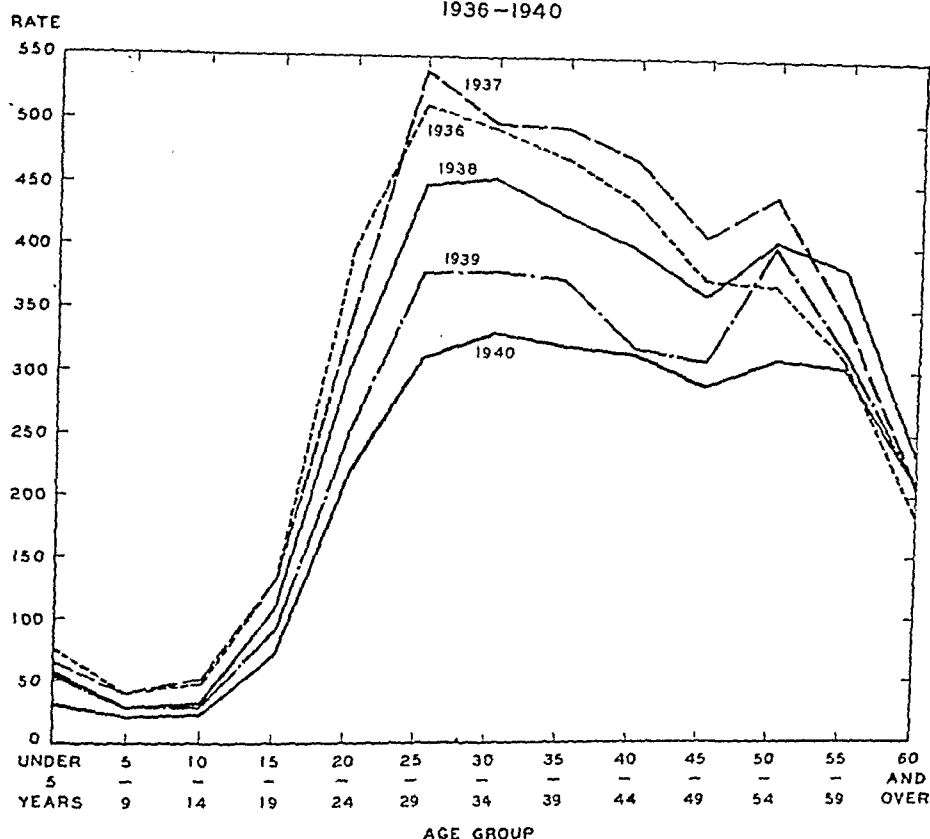
Figure 1 presents graphically the prevalence rates for each of the years under consideration. It is notable that for each year after 1937 there was a reduction in newly discovered case rates for each age group (except for those of 55-59 years and over 60 years in 1938). The decrease was proportionately greater in younger persons, the rates for the 10-14 year age group having declined 52.1 per cent by 1940, those of 15-19 years by 45.5 per cent, of 20-24 years by 44.9 per cent, and for 25-29 years by 39.6 per cent. The decrease in rates beyond this group was less marked, though definite. By 1940

the curve had flattened out so that the rates of reported cases in young adults was only slightly higher than for older persons.

In interpreting these figures, we must first consider the circumstances under which they were obtained. As pointed out previously, all records of cases reported prior to January 1, 1936, were disregarded in building the present case register. The cases reported during 1936, therefore, were drawn from (1) the unknown number of cases under physicians' care at the beginning of the year, together with (2) old cases diagnosed for the first time during the year, and (3) newly acquired infections coming under medical observation. Duplicate reports for patients recorded for the first time within the year were eliminated but no attempt was made to remove duplicate records of those reported prior to the inauguration of the new method. The reporting system in 1936 was more or less in the nature of an annual survey of cases under treatment, except that the identities of the individuals were established. In 1937, the reports included those of old patients missed in 1936 together with new in-

FIGURE 1

TOTAL REPORTED SYPHILIS CASE RATES, PER 100,000 POPULATION, BY AGE GROUPS  
NEW YORK STATE, EXCLUSIVE OF NEW YORK CITY  
1936-1940



fections of 1937 and those acquired during the previous year but failing to seek medical advice prior to 1937. An analogous situation existed during the subsequent 3 years. These reductions in the figures from year to year do not necessarily indicate a decrease in the prevalence of syphilis, however. They may indicate only the extent to which the "pool" of unknown but already existing cases is brought under treatment. As the size of the "pool" is reduced and as patients are discovered early the curve of total patients should approach that of early ones. It is claimed that this has occurred in Sweden and that reports of new cases indicate the total. We have a long way to go to reach this objective.

The decline in the rates in the young adult groups may be significant. It is

well known that syphilis has its onset with greater frequency in these years. We also know that reporting is not wholly accurate and that errors may be made in the classification of cases. Whether or not the cases represented here are classified as early or late, they represent a potentially infectious group because of the relatively short duration of their infections, and their discovery and treatment should reduce the number of infectious cases at large and thereby reduce the risk of exposure to syphilis. It is encouraging that the reduction in rates has been greater in these than in any other groups. Syphilis in childhood beyond the first few years of life, and in adults beyond the middle thirties is of little importance from the standpoint of syphilis control. The former generally represents a late con-

genital infection, the latter the end results of an infection acquired in younger years. Neither is a danger from the standpoint of infectiousness. Both may be prevented by the control of syphilis between the critical years of 15 and 34.

It is not infrequently stated that, because of the chronicity of syphilis, its prevalence would tend to be greater in older groups because of a cumulative effect. This would be true if it were not for factors tending to reduce the prevalence of the disease in them. Surveys, which our figures support, have shown that the prevalence of syphilis is highest in these groups in which the acquisition of the disease is greatest, and that a decline in prevalence follows very closely the decline in incidence. In other words, beginning with population groups of 35 years and over, the number of cases removed annually is larger than the number added through new infections. There are three factors tending to bring about the reduction of syphilis in these groups, namely, spontaneous cures in the untreated, cures by treatment, and deaths among syphilitics in excess of the non-syphilitics. The degree to which each is responsible has been variously estimated, but is still unknown; their combined effect is considerable.

With this in mind, let us consider the prevalence of syphilis in the 50-54 year age group. It will be noted that the annual rates in this group are higher than in the 45-49 year group except for 1936, the first year of the program. A definite explanation for the apparent greater prevalence in the 50-54 year group cannot be given. It cannot be attributed to newly acquired infections. The number of such cases was very low. Nor does it seem reasonable that efforts at case finding were more productive for this group. Physical incapacitation from late syphilis usually occurs between 40 and 50 years, and

had the disease itself been responsible for bringing larger numbers of cases to light, its effects would have been reflected there. The most likely explanation is that syphilis reached epidemic proportions when the group of persons now 50-54 years of age were young. Further studies are being made to find the answer.

#### INCIDENCE OF SYPHILIS IN UPSTATE NEW YORK

Let us refer to the reported cases of early syphilis for further light upon the occurrence and trend of syphilis in upstate New York. As indicated previously, early syphilis is defined on the report card as that of less than one year's duration. Such cases after 1936 were subdivided into primary, secondary, or other early, which latter term referred largely to early latent cases.

While the cases in existence prior to January 1, 1936, should not have influenced the number of cases of early syphilis reported after January 1, 1937, there is a possibility of such influence in the "other early" classification. Physicians may report young adults as early cases when no history of a chancre or secondaries has been obtainable, relying upon the probability of a short duration of the disease in these patients. The distribution of these cases, however, is exactly the same as that of primary or secondary syphilis, so we believe that, with few exceptions, cases so reported actually were early.

During the 5 year period 1936-1940, 8,194 cases of early syphilis were reported in New York State exclusive of New York City. Of these, 2,513 were classified as primary, 1,884 as secondary, 1,021 as "other early," and 2,776 of unstated type. Their distribution by years is shown in Table 3.

The distribution of these cases according to age, is presented in Table 4. As would be expected, the attack rates during childhood were low. There was

TABLE 3

*Number of Reported Acquired Early Syphilis Cases  
New York State (Exclusive of New York City)*

1936-1940

Diagnosis	Total	1936	1937	1938	1939	1940
Primary	2,513	*	898	711	447	457
Secondary	1,884	*	608	594	355	327
Other early	1,021	*	352	252	221	196
Early, type not stated	2,776	2,268	270	149	58	31
Total early	8,194	2,268	2,128	1,706	1,081	1,011

\* The type of early syphilis was not designated on the report card in use in 1936.

a marked rise in early acquired syphilis in the 15-19 year age group, peak incidence being reached at 20-24 years. There was relatively little difference in the rates for the latter group and the group 25-29 years. Following this, the attack rates dropped markedly and continued to decrease for subsequent age groups.

These figures are in accord with clinical observations to the effect that syphilis occurs with greatest frequency during young adult life. They further support the premise that control of syphilis among young adults will lead to a reduction of the disease throughout the life span.

Of particular interest is the reduction in the number of early cases of syphilis reported, and the decline in attack rates which occurred in the 5 year period. In 1936 there were 2,268 early cases reported, or 39 per 100,000 population, as compared with 1,011 cases, or 17 per 100,000 population in 1940, a reduction of 56 per cent. This decline was observed for every age group except the childhood groups in which the attack rates were already very low, and the number of cases relatively unimportant.

The decrease in reported early cases from year to year considered alone is not an indication of an actual reduction

TABLE 4

*Reported Early Syphilis Cases and Rates per 100,000 Population\* by Age Group  
New York State (Exclusive of New York City)*

1936-1940

Age Group	Total	Cases					Case Rates				
		1936	1937	1938	1939	1940	1936	1937	1938	1939	1940
Total	8,194	2,268	2,128	1,706	1,081	1,011	39	36	29	18	17
Years											
Under 5	70	30	15	9	16	..	7	4	2	4	..
5-9	10	3	6	..	1	..	†	1	..	†	..
10-14	55	9	20	12	7	7	2	4	3	2	2
15-19	851	214	197	187	147	106	44	39	37	29	20
20-24	2,131	583	534	435	286	293	119	109	88	58	59
25-29	1,864	493	505	382	253	231	110	112	84	55	50
30-34	1,153	309	301	249	161	133	69	67	55	35	29
35-39	733	200	179	177	89	88	45	40	39	20	19
40-44	470	139	140	96	43	52	31	31	21	9	11
45-49	299	88	84	52	28	47	21	20	12	6	11
50-54	216	58	65	43	25	25	16	17	11	7	7
55-59	117	30	37	22	11	17	10	13	7	4	6
60+	100	26	24	32	9	9	4	3	4	1	1
Not stated	125	86	21	10	5	3	..	..	..	..	..

\* July 1 estimate based on 1940 census

† Less than 1 per 100,000 population



TABLE 7

*Reported Early Cases and Case Rates per 100,000 Population\* by Population Group  
New York State (Exclusive of New York City)  
1936-1940*

Population Group	Total	Cases					Case Rates				
		1936	1937	1938	1939	1940	1936	1937	1938	1939	1940
Total	8,194	2,268	2,128	1,706	1,081	1,011	39	36	29	18	17
Places over											
250,000	1,744	658	439	226	209	212	73	49	25	23	24
50,000-250,000	1,655	415	437	415	200	188	41	43	41	20	19
25,000-50,000	638	181	164	136	85	72	50	46	38	24	20
10,000-25,000	1,283	334	351	290	155	153	46	48	39	21	20
5,000-10,000	377	76	108	79	62	52	26	37	27	21	16
2,500-5,000	397	111	93	96	48	49	35	29	30	15	16
Under 2,500	354	98	89	73	51	43	26	24	19	13	12
Towns †	1,381	308	341	333	216	183	17	18	18	11	10
Institutions	365	87	106	58	55	59	102	117	62	56	58

\* July 1 estimate based on 1940 census

† Includes all unincorporated territory

The attack rates, shown by the number of early cases reported, (Table 7) followed the same trend as the prevalence rates. It is indicated that a reduction in newly acquired syphilis has occurred throughout the state.

#### SUMMARY AND CONCLUSIONS

The prevalence and trend of syphilis in New York State (exclusive of New York City) are discussed, based on 5 years' experience with a new method of securing morbidity reports. The data relative to prevalence of syphilis in this state are in agreement with those collected through survey methods, to the effect that syphilis is of greatest importance in young adults, and that

the control of the disease during this time will ultimately reduce it in either extreme of life.

Distribution of cases according to the size of the communities from whence they were drawn, indicates that syphilis is more important in urban than in rural areas.

A progressive decline in the number of cases reported and in prevalence and incidence rates was observed during the 5 year period. It is believed that since this has occurred during a time in which case finding procedures have been more extensively applied than ever before, an actual reduction in syphilis in New York State is indicated.

# The Use of Vital Records in the Reduction of Fetal, Infant, and Maternal Mortality\*

Operative Procedures for Delivery and Their Effects on Neonatal and Maternal Mortality

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FOR some time the Bureau of Vital Records and Statistics of the Health Department of the City of New York has realized that the information from vital records can be instrumental, either directly or indirectly, in the reduction of fetal, infant, and maternal mortality, and it has been devoting a great deal of attention to making these vital records as informative as possible.

## DIRECT APPROACH TO REDUCTION IN INFANT MORTALITY

So far, the department's direct efforts have been limited to the attempt to reduce the mortality among new-born infants immediately *after* discharge from the hospital. Because it is required that births be reported within two days, it is possible to place sufficient information from birth records in the hands of the visiting nurse so that she can arrange to make a home visit to any mother and child, not attended by a private physician, immediately after their return from the hospital. Every day the Statistical Division of the Bureau of Vital Records sends to each district health

center a list of the births to mothers residing in that district as reported the previous day. These lists are prepared from index tabulating cards and give the name, home address, place of birth, color, and sex of each infant born alive, together with information regarding the number of this child in the family, its birth weight, and whether the case was that of a private practitioner or a general service (ward) case. From a study of these lists the visiting nurse in each district determines just which mothers and babies should be called upon and, should selection be necessary, preference is given to those whose records show that they are either first-born or were underweight at birth.

This service was started in October, 1940, and, whether as a result of it or not, the registration at the well baby clinics in the first two months of 1941 was more than 20 per cent greater than in the corresponding period of 1940.

## INDIRECT APPROACH TO REDUCTION IN FETAL, INFANT, AND MATERNAL MORTALITY

### *Method of Study*

In 1933 the New York Academy of Medicine published the results of a

\* Read before the Vital Statistics Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 17, 1941.

survey of maternal mortality in New York City.<sup>1</sup> It was this courageous report that focused attention on the shortcomings in obstetrical practice in the city and led to the formation of special committees to study the problem in the medical societies of four of the five counties that comprise the City of New York. Subsequently additional committees were appointed by the medical societies in two counties to study the problem of fetal and neonatal mortality.

In order to function intelligently, these committees sought and obtained the collaboration of the Health Department. Since 1936, the Statistical Division of the Bureau of Vital Records has been sending to each committee each week a list of all the cases in which the committee is interested, together with photostatic copies of all birth and death certificates having a bearing on those cases. Thus, in the case of a maternal death, a committee studying maternal mortality receives a copy of: (1) the death certificate of the mother, (2) the birth certificate of the child (if born alive), or (2a) the fetal death (stillbirth) certificate (if the child was born dead), and (3) the death certificate of the child (if the child born alive died before its mother).

A committee studying fetal and neonatal mortality receives photostatic copies of: (1) the fetal death (stillbirth) certificate (if the child was born dead and the fetus had completed 28 weeks of gestation), (2) the death certificate (if the child was born alive and died before completing ten days of life), and (3) the birth certificate of any child described in the item immediately preceding.

#### *The Confidential Medical Report*

It was soon apparent that the information given on the certificates of birth and stillbirth in 1936 was of practically no value in shedding light on the causes that led to the death of an infant born

alive or to the death of a fetus before birth. In an attempt to meet this lack of essential information, the senior author of this paper proposed that supplementary medical information for each live birth and fetal death be recorded in a confidential report on the back of the certificate. This proposal was accepted and in March, 1938, a confidential supplementary medical report, utilizing the backs of the birth and stillbirth certificate forms, first came into use in New York City and has been used ever since. It contained information on such questions as:

Period of gestation (in weeks)

Length of the child

Weight of the child

Complications of pregnancy, if any

Results of the serologic test for syphilis

Duration of labor

Operative procedures employed at delivery and the indications for such procedures

Later, another question was added: whether the mother was a private physician's patient or a general service (ward) case. These questions were formulated after consultations with members of the committees who also assisted in the preparation of the codes used in tabulating and analyzing the information derived from the reports. The medical profession has coöperated magnificently and on only few birth certificates is this confidential information lacking.

#### *Tabulating Technics*

In order to make the fullest use of the material thus made available, the obstetrical histories as given in the confidential medical reports on the backs of the live birth and fetal death certificates had to be correlated with the information from the certificates of death of (a) infants who died under one month of age, and (b) women who died from puerperal causes. To do this, two special sets of composite tabulating cards are prepared. The "neonatal mortality composite card" is obtained by

reproducing entirely the punch card recording the birth of each infant who dies during the first month of life; and adding to it certain pertinent information from the tabulating card recording that infant's death.

The "maternal mortality composite card" is obtained by reproducing entirely each punch card recording a puerperal death and adding to that information certain pertinent data from the tabulating card recording the live birth or fetal death associated with the mother's death. Whether the mother died undelivered or her death was associated with a live or dead birth, and, if delivered, the time interval between delivery and death are also indicated on the card.

In our research program we have been guided by the idea attributed to Dr. C. E. K. Mees, head of the Research Laboratories of the Eastman Kodak Company, in the September, 1941, issue of the *Reader's Digest* (page 71). Dr. Mees is quoted as saying: "The thing to do is to let the research man poke his inquisitive nose into some problem that fascinates him, and then follow it from fact to fact, no matter how far off the original track it leads." Acting on this principle we made a number of tabulations; these led to others; and the end is not yet in sight. All are prepared with the sole aim of shedding light on the causes of death among mothers and the babies they are bringing into the world. The results of the first studies of this material, based on the births and deaths occurring in 1939, were published in the *Bulletin* of the New York Academy of Medicine<sup>2</sup> and *The Child*.<sup>3</sup>

#### RECENT FINDINGS

##### *The Sample*

In 1940, 107,287 live births were reported in New York City. Of these, 101,141, or 94 per cent, occurred in hospitals; 99,005 were white and 8,282

were recorded as colored. The cards for the white births are tabulated in groups—white males to primiparous mothers, white females to primiparous mothers, white males to multiparous mothers, white females to multiparous mothers, etc. As it was not possible to complete the analysis of the data for all these groups in time for this paper, it was decided to base this report on a group for which the analysis had been completed, namely, first born white males. The "under-weights" were eliminated, since neonatal mortality in children with birth weights under 2,500 grams varies with the weight at birth.<sup>3</sup> Because of their peculiarities multiple births were also excluded with the result that the sample analyzed is limited to single white male live first births weighing 2,500 grams or more delivered in hospitals. Because of the special nature of the sample, readers are cautioned against drawing *general* conclusions from the findings here presented.

##### *Use of Operative Procedures*

Table 1 shows the frequency of operative or instrumental deliveries by type of institution in which birth occurred; municipal hospital, voluntary hospital, or proprietary hospital.\* We find that 47 per cent of all the cases were delivered operatively, if episiotomy is not considered an operative procedure. Operative deliveries were most frequent in the voluntary hospitals where they were used in 50 per cent of the cases; not so common in the proprietary hospitals, with 45 per cent; and least frequent in the municipal hospitals, with 38 per cent. Low forceps was naturally the most frequent type of instrumental de-

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\* Municipal hospitals are financed by the city and are collectively managed by the Department of Hospitals for the benefit of the indigent poor.

Voluntary hospitals are individual institutions managed by philanthropic non-profit-seeking organizations receiving some financial assistance from the City.

Proprietary hospitals are individual institutions managed by profit-seeking organizations.

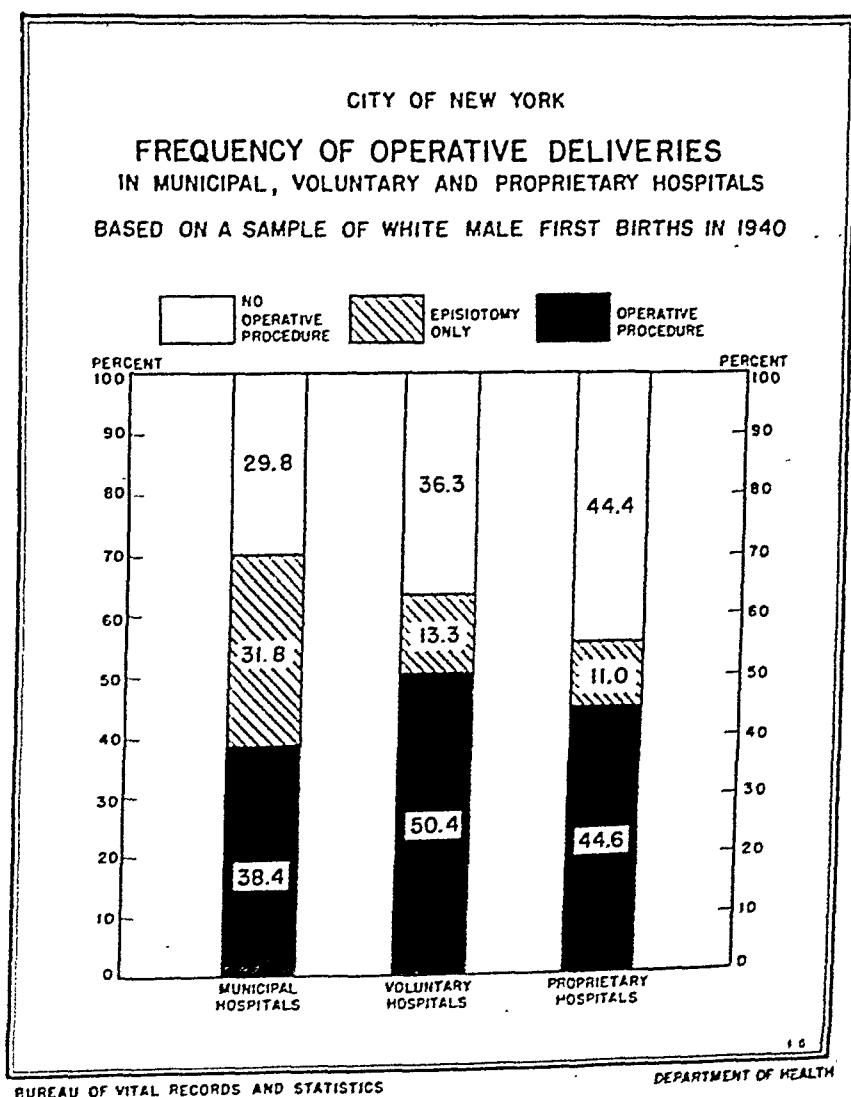
TABLE 1  
*City of New York*  
*Operative Procedure Employed at Birth\**  
*By Type of Institution*  
 1940

Operative Procedure Used in Delivery	Number				Per cent			
	Type of Institution				Type of Institution			
	All Hospitals	Municipal	Voluntary	Proprietary	All Hospitals	Municipal	Voluntary	Proprietary
Total	20,479	1,899	11,375	7,205	100.0	100.0	100.0	100.0
No operative procedure	7,896	566	4,130	3,200	38.6	29.8	36.3	44.4
Episiotomy only	2,907	604	1,510	793	14.2	31.8	13.3	11.0
Low forceps	7,017	571	4,092	2,354	34.3	30.1	36.0	32.6
Mid forceps	1,545	87	955	503	7.5	4.6	8.4	7.0
High forceps	73	6	30	37	0.4	0.3	0.3	0.5
Version, no forceps	32	1	21	10	0.2	0.1	0.2	0.1
Version, with forceps	15	2	10	3	0.1	0.1	0.1	†
Breech extraction, no forceps	260	21	155	84	1.3	1.1	1.4	1.2
Breech extraction, with forceps	72	9	33	30	0.4	0.5	0.3	0.4
Cesarean section	662	32	439	191	3.2	1.7	3.9	2.7

\* Special sample—single, white, male first births born alive in hospitals and weighing 2,500 grams or more

† Less than 0.05

CHART 1  
 Basic Data on  
 Frequency of  
 Operative  
 Deliveries



livery. Mid-forceps and Cesarean sections were next in order of frequency. Basic data on this point are presented in Table 1 and Chart I.

The data from this same sample were next tabulated by type of operative pro-

cedure employed, subdivided according to the reported reason—namely, the complication of labor or delivery—for the use of the operative procedure. These results are shown in Tables 2, 3, and 4.

TABLE 2

*City of New York*  
*Complications of Labor or Delivery*  
*With Operative Procedures Employed at Birth\**  
1940

<i>Complications of Labor or Delivery</i> <i>(Reason for Operative Procedure)</i>	<i>Total</i>	<i>Type of Operative Procedure</i>							<i>No Operative Procedure</i>
		<i>Episiotomy</i>	<i>Low Forceps</i>	<i>Mid Forceps</i>	<i>High Forceps</i>	<i>Version, with or without Forceps</i>	<i>Breech Extraction</i>	<i>Cesarean Section</i>	
Total births	20,479	2,907	7,017	1,545	73	47	332	662	7,896
Prolonged labor	5,468	919	3,263	1,139	52	20	43	32	....
Elective, prophylaxis	4,859	1,869	2,791	80	3	9	106	1	....
Disproportion, dystocia	1,000	83	303	175	13	9	14	403	....
Fetal distress	660	16	509	108	4	4	17	2	....
Medical condition in mother	219	10	108	25	..	2	3	71	....
Breech presentation	151	..	..	..	..	3	148	..	....
Elderly primipara	127	4	11	5	..	..	1	106	....
Placenta praevia, premature separation	50	2	7	4	..	..	..	37	....
Previous abdominal operation	4	..	..	..	..	..	..	4	....
Other complications or not stated	45	4	25	9	1	..	..	6	....
No complications	7,896	..	..	..	..	..	..	..	7,896

\* Special sample—single, white, male first births born alive in hospitals and weighing 2,500 grams or more

TABLE 3

*City of New York*  
*Percentage Frequency of Each Operative Procedure Employed in Response to*  
*Various Complications of Labor and Delivery\**  
1940

<i>Complications of Labor or Delivery</i> <i>(Reason for Operative Procedure)</i>	<i>Total</i>	<i>Type of Operative Procedure</i>							
		<i>Episiotomy</i>	<i>Low Forceps</i>	<i>Mid Forceps</i>	<i>High Forceps</i>	<i>Version, with or without Forceps</i>	<i>Breech Extraction</i>	<i>Cesarean Section</i>	<i>No Operative Procedure</i>
Total births	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Prolonged labor	26.7	31.6	46.5	73.7	71.2	42.6	13.0	4.8	....
Elective, prophylaxis	23.7	64.3	39.8	5.2	4.1	19.1	31.9	0.2	....
Disproportion, dystocia	4.9	2.9	4.3	11.3	17.8	19.1	4.2	60.9	....
Fetal distress	3.2	0.6	7.3	7.0	5.5	8.5	5.1	0.3	....
Medical condition in mother	1.1	0.3	1.5	1.6	....	4.3	0.9	10.7	....
Breech presentation	0.7	....	....	....	....	6.4	44.6	....	....
Elderly primipara	0.6	0.1	0.2	0.3	....	....	0.3	16.0	....
Placenta praevia, premature separation	0.2	0.1	0.1	0.3	....	....	....	5.6	....
Previous abdominal operation	†	....	....	....	....	....	....	0.6	....
Other complications or not stated	0.2	0.1	0.4	0.6	1.4	....	....	0.9	....
No complications	38.6	....	....	....	....	....	....	....	100.0

\* Special sample—single, white, male first births born alive in hospitals and weighing 2,500 grams or more

† Less than 0.05

TABLE 4

*City of New York*  
*Percentage Frequency of Various Complications of Labor and Delivery Eliciting the*  
*Several Operative Procedures\**  
 1940

<i>Complications of Labor or Delivery (Reason for Operative Procedure)</i>	<i>Total</i>	<i>Type of Operative Procedure</i>							
		<i>Episiotomy Only</i>	<i>Low Forceps</i>	<i>Mid Forceps</i>	<i>High Forceps</i>	<i>Version, with or without Forceps</i>	<i>Breech Extraction</i>	<i>Cesarean Section</i>	<i>No Operative Procedure</i>
Total births	100.0	14.2	34.3	7.5	0.4	0.2	1.6	3.2	38.6
Prolonged labor	100.0	16.8	59.7	20.8	1.0	0.4	0.8	0.6	....
Elective, prophylaxis	100.0	38.5	57.4	1.6	0.1	0.2	2.2	†	....
Disproportion, dystocia	100.0	8.3	30.3	17.5	1.3	0.9	1.4	40.3	....
Fetal distress	100.0	2.4	77.1	16.4	0.6	0.6	2.6	0.3	....
Medical condition in mother	100.0	4.6	49.3	11.4	....	0.9	1.4	32.4	....
Breech presentation	100.0	....	....	....	....	2.0	98.0	....	....
Elderly primipara	100.0	3.1	8.7	3.9	....	....	0.8	83.5	....
Placenta praevia, premature separation	100.0	4.0	14.0	8.0	....	....	....	74.0	....
Previous abdominal operation	100.0	....	....	....	....	....	....	100.0	....
Other complications or not stated	100.0	8.9	55.6	20.0	2.2	....	....	13.3	....
No complications	100.0	....	....	....	....	....	....	....	100.0

\* Special sample—single, white, male first births born alive in hospitals and weighing 2,500 grams or more

† Less than 0.05

In Table 3, taking the total of each type of operative delivery as 100 per cent, we show the percentage frequency with which each of the various operative procedures was used as a response to the several complications of labor or delivery. From this table, we see that in 40 per cent of the cases in which low forceps were employed, they were applied because the doctor elected to do so and gave no other reason; in almost half of the cases they were applied because of prolonged labor; fetal distress and disproportion also were indications for the use of low forceps.

The complications most frequently indicating the use of mid-forceps and high forceps were: deep transverse arrest and persistent occiput posterior, prolonged second stage, and other forms of prolonged or arrested labor—all grouped under prolonged labor.

The four most frequent reasons given for performing Cesarean sections were: inadequate pelvis and oversized fetus—grouped under disproportion—elderly

primipara, and some medical condition in the mother.

In Table 4 we have reversed the procedure of Table 3, and show the percentages of each complication of labor or delivery in which the various operative procedures were employed. In cases of placenta praevia with premature separation, for example, Cesarean section was employed, according to the reports, in 74 per cent, low forceps in 14 per cent, mid-forceps in 8 per cent, and episiotomy only in 4 per cent. Similarly, Cesarean section was the operation of choice in cases of inadequate pelvis (disproportion), with low forceps and mid-forceps following.

#### *Neonatal Mortality*

After learning the frequency and the reasons for each type of operative procedure, we were interested in finding if differences existed in neonatal and maternal mortality rates associated with each type of delivery. The results are shown in Table 5 and Chart II. Some

TABLE 5

*City of New York*  
*Neonatal\* and Maternal Deaths Associated with Various Types of Operative*  
*Procedure Employed at Birth†*  
 1940

Operative Procedure Used in Delivery.	Number of Live Births	Neonatal Deaths		Maternal Deaths	
		Number	Rate per 1,000 Births	Number	Rate per 10,000 Births
Total	20,479	248	12	36	17
No operative procedure	7,896	60	8	4	5
Episiotomy only	2,907	18	6	4	14
Low forceps	7,017	83	12	9	13
Mid forceps	1,545	41	27	3	19
High forceps	73	7	96	..	..
Version, no forceps	32	4	125	1	313‡
Version, with forceps	15	4	267	..	..
Breech extraction, no forceps	260	10	38	4	154
Breech extraction, with forceps	72	6	83	..	..
Cesarean section †	662	15	23	11	166

\* Under one month

† Special sample—single, white, male first births born alive in hospitals and weighing 2,500 grams or more

‡ Based on only one death

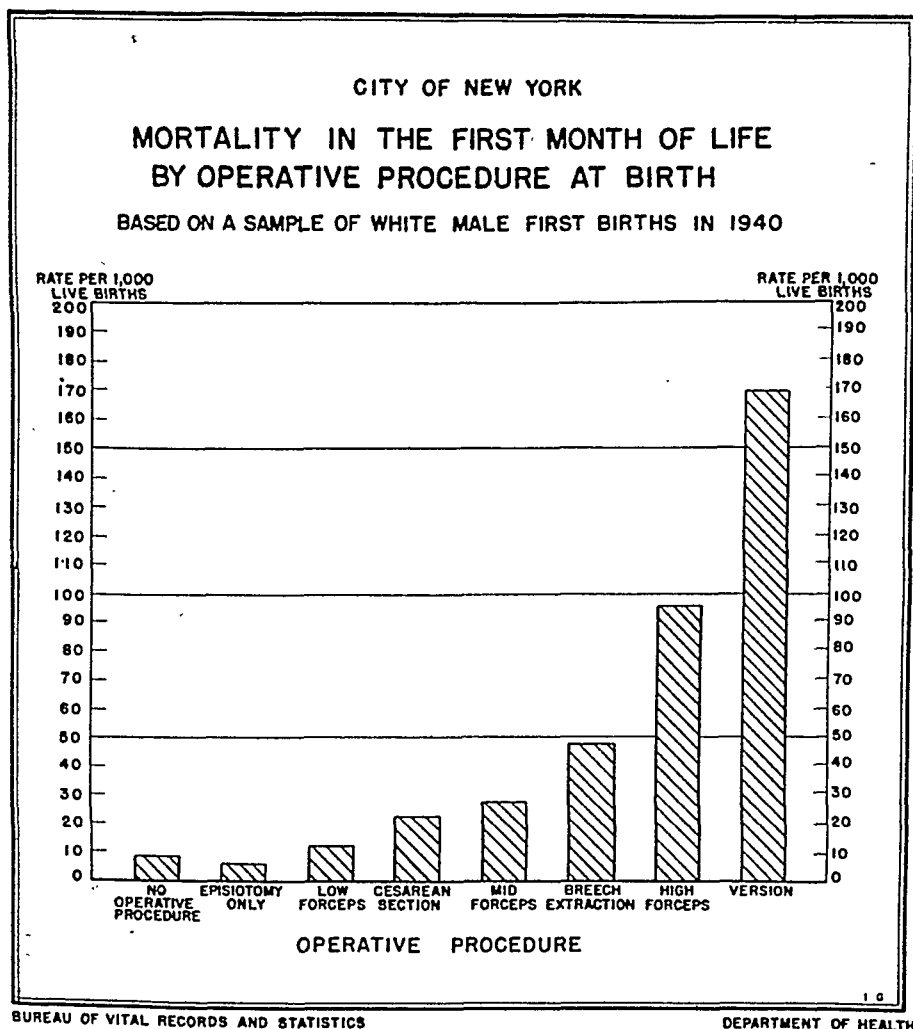


CHART 2  
 Neonatal  
 Mortality



of the numbers are small, but there seems to be an indication that the lowest neonatal (under one month) mortality rate, 6 per 1,000 live births, occurred among children delivered when episiotomy only was employed. The group with no operative procedure was not far behind with 8, while a rate of 12 was found among those delivered by means of low forceps. The highest mortality rates were found in the groups delivered by version and breech extraction.

### *Maternal Mortality*

While the number of maternal deaths associated with the births in this sample is small, it appears that a considerably higher maternal mortality rate followed Cesarean section and breech extraction than other forms of operative delivery.

It is entirely possible that the differences in both the neonatal and maternal mortality rates may be due to factors other than type of delivery. The reasons which lead to operative procedures may exert as much influence as the actual procedure employed, or even more.

### SUMMARY

We have referred to the unique method of collecting medical information bearing on pregnancy and delivery which has been employed in the City of New York since early in 1938, and to the direct and indirect use the Health Department makes of this information. We have also described the close collaboration between the Bureau of Vital Records and Statistics and the special committees of the Medical Societies in four of the five counties that comprise the City of New York.

We have presented data regarding operative deliveries, based on a sample of 20,479 single, white, male, live first births in hospitals in the city in 1940, showing that:

1. In the voluntary hospitals some operative or instrumental procedure was used in half of the deliveries, and that the municipal hospitals reported the smallest percentage of operative deliveries.

2. The most frequently used operative or instrumental procedures were: low forceps, mid forceps, and Cesarean section.

3. Low and mid-forceps were usually applied because of some form of prolonged labor. The reasons given for the use of Cesarean section were: inadequate pelvis, oversize fetus, elderly primipara, and a medical condition in the mother.

4. Conversely, when some form of arrested labor or fetal distress was encountered, low or mid-forceps were applied. In case of disproportion, Cesarean section was the operation of choice.

5. Children delivered spontaneously, or when only an episiotomy was done, had the best chance of surviving the first month of life. This chance was small in cases of children delivered by version.

6. The highest maternal mortality rates were associated with Cesarean section and breech extraction.

### CONCLUSION

No attempt has been made to analyze completely, nor to interpret the findings that have been made this far, but it is hoped that these and similar findings to be gathered as times goes on, may serve the medical profession in throwing light on the causes of fetal, infant, and maternal mortality. It is further hoped that, with such a tremendously large volume of data as is offered by the vital records of the City of New York, the Statistical Division of the Bureau of Vital Records and Statistics may assist the medical profession in reducing all mortality associated with child bearing.

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# Health Education in Mexico\*

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YOU have undoubtedly heard the story about the native and the professor who wanted to cross a swift river. I shall recall it to you: While in the canoe, the professor tried to amuse himself by questioning the native: "Pedro, my boy, do you know botany?" "No, señor," replied the paddler naively. "Oh! you have lost part of your precious life," replied the professor. And then: "My man, do you know astronomy?" "No, señor," answered Pedro very politely. "Oh! you have lost part of your precious life." Again: "Do you know biology?" "No, señor," was the humble answer, and another "Oh! you have lost a part of your precious life," was again and again the comment of our professor after the paddler had replied to questions about his knowledge. When the conversation was over Pedro continued paddling and kept thinking about how many parts of his precious life he had lost for not having learned the many queer things the savant suggested, until they arrived at the rapids and, notwithstanding Pedro's skill, the canoe overturned and into the river went Pedro and our professor. Our savant cried out for help and Pedro swimming asked: "Maestro, do you know swimming?" "No," yelled back the savant. "Then," shouted Pedro, "you have lost your whole precious life."

In our daily life and work we meet

many Pedros and many savants interested only in queer little things; neglecting to learn the important practical facts about health and they drown on one of the many pitfalls in the river of life.

Wherever the remains of past civilizations are studied, there are found vestiges of activities carried on to improve the health of communities by sanitation of the environment and by personal hygiene. On studying our history, concepts of health education in Mexico can be traced, although time and again we learn that the progress of preventive medicine has been delayed by ignorance, prejudice, superstition, and pestilence.

Thus, I shall relate to you one of the episodes in the history of health education in Mexico which has impressed me most:

One hot day in August, 1804, the people of the Noble and Faithful City of Mexico were surprised to see a grand parade headed by the carriage of the Viceroy Iturrigaray. Following him were members of the Board of the King's Physicians, university and school professors, Sires of the Royal Audience, elders and members of the Supreme Courts, judges and noblemen. Rarely had the inhabitants of Mexico seen such a magnificent parade as that which took the road to the orphan asylum. There, in a huge hall, Dr. Alejandro Arbolea, member of the Board of King's Physicians, inoculated with Jenner's vaccinia the son of Viceroy Iturrigaray. But, why such elaborate and expensive display for such a routine

\* Read before the Public Health Education Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 14, 1941.

matter as vaccination against smallpox? There was a good reason. Drs. Francisco Xavier de Balmis and Antonio Gutierrez, after several months of painstaking work on board two sailing vessels, had succeeded in bringing to Mexico the Jenner vaccinia. The people of the city, on being told by the local physicians that such a procedure as vaccination was not only false but dangerous, were almost incited to revolt and Viceroy Iturrigaray, being convinced that the procedure was based on truth, had his own child vaccinated by Dr. Arboleya. The news spread. Doctors swore that the child would die, but the people knew that the Viceroy would not have exposed his son to such a danger without being convinced of the safety of the vaccine. After that event they were convinced that the procedure was safe, and thousands of them were vaccinated against smallpox.

This drama carried out nearly 150 years ago by Viceroy Iturrigaray had all the features of modern health education—attracting the attention of the public, maintaining its interest, moving it to action, and at the end attaining its goal. Thus, health education in Mexico has developed and progressed with ups and downs under the auspices of governmental agencies. The task is not easy, indeed, it is a very hard one because Mexico, like many other Latin American countries, is essentially rural.

The rural population of Mexico, according to the census of 1930, is 65 per cent of the whole population, and in some states is 80 per cent. The number of illiterates is still high, about 55 per cent. Lack of culture and the prevalence of superstitions, medieval prejudices, and odd habits in rural communities make the solution of health problems extremely difficult. The somewhat inadequate biostatistics show that Mexico still pays a heavy toll in gastrointestinal disorders, respiratory infections, and parasitic diseases. In some regions of

the country high mortality of infants and children is still registered and the number of mothers who are dying demands more widespread public health activities. Undernourishment, bad housing, inadequate water supplies, and sanitation with their inevitable accompaniment of malaria, dysenteries, hookworm disease, tuberculosis, and some other ills cloud the picture of health south of the border. Just imagine for a moment that all the economic, social, and medical problems which you face in some regions of Kentucky, of Georgia, of Tennessee, of Mississippi—even in the mountains of Pennsylvania—are spread over our entire country and you will have a clear picture of the work which we must perform to control morbidity and mortality. However, we are optimistic. On looking back on conditions prevailing 150 years ago, just before Viceroy Iturrigaray started to educate his people through a demonstration, we see that hygiene and sanitation did not exist and that public health has made progress since that time.

Returning again to biostatistics, the infant mortality rate, which in 1900 was 260 per 1,000 living births, was less than 125 in 1938. In 1922 the smallpox death rate was 83 per 100,000, and in 1940 it was 5; the typhus mortality rate in 1931 was 16, and last year was 9; tuberculosis killed 79 per 100,000 in 1922, while in 1938 it took only 55. The whooping cough mortality rate was 256 in 1922, and 153 in 1938. Malaria, water-borne diseases, milk-borne ills, housing, sanitation, and feeding are now better understood and much is being done to solve the difficulties associated with them. In 1900 the expectation of life of a newborn infant was only 24 years, while in 1936 it was 32 to 44 years, depending upon his birth place, or an average of approximately 34 years. This marks steady progress in the increase of the

span of life for a poor country like Mexico, with its heritage of Spanish individualism and Indian fatalism.

That the progress is due only to health education of the masses cannot be stated without reservation, for every one of us is aware that it is difficult to evaluate changes in health conditions and that there is no valid measurement for health education over a short span of life; but there is no doubt that health education in Mexico, as in many other countries, has substantially helped to improve conditions of life.

Indeed, the most obvious measurements of the progress and results attained by health education are: first, the declining mortality rate; second, the duration of life, and ours is longer every decade; and third, the best measure of all, is the extent to which people habitually look to the health and medical agencies for coöperation, help, and advice with relation to health and medical problems. I agree with Bauer and Hull<sup>3</sup> that, "When public health work grows and prospers side by side with the effective practice of preventive and curative medicine, we have evidence of a sound program of health education," and I shall add that, when the people themselves willingly give part of their income to support and increase the health and medical services of their community, and fight when these services are taken away, anybody can be sure that health education is in the very heart of the people.

Health education in the past was conveyed through the methods of trial and error, following the example of nature; in the present, the tendency is to apply the sound and scientific method of modern education. When public health work meant epidemic control its keystone was the physician. His work was immunization, quarantine, disinfection, and punishment of those who were reluctant to obey his orders. When later he was obliged to visit homes he found

that the effectiveness of his work could be increased by having a nurse to assist him. The nurse has now replaced the old sanitary inspector with the viewpoint of the policeman, and her educational work has taken the place of the obsolete dictatorial procedures.

Let us examine two different pictures: one in the 18th century and one in 1941. It is the great square in Mexico City; during one of those hot days in May a man is tied to a scaffold. He is in rags, sweating and bleeding, all the women coming from the markets are throwing at him rotten eggs, ripe tomatoes, and all kinds of odds and ends. He was a milk vendor and was found watering his wares. He is paying the penalty imposed upon violators of the city's ordinances.

On the other hand, we are in 1941. Two girls dressed in a well known white uniform knock at the door of two houses in one of the streets of a native village. Smiling faces welcome them; children hang around them; and the girls start their daily work in the homes of those who need them most. They show the people how to bathe the children, how to prepare food; they immunize susceptibles against diseases and do the many things which a public health nurse does. That job is done from the Río Grande to the Guatemala border by about 1,500 nurses, an average of one for about every 12,000 inhabitants.

In 1900, scarcely half a dozen of the states supported nominal health services; in 1927, the Federal Department of Health had 30 health centers. Ten years later the number was 274, well scattered over the Republic. During the present year 450 health centers and 121 rural health units, with nearly 900 health officers and 1,500 nurses and other auxiliary personnel, endeavor to influence the lives and health of the men, women, and children of Mexico, a country of nearly 20,000,000 inhabitants.

The methods they use, the procedures

they follow, are the same as those which you advise. The channels through which health education is carried to the people of our old Mexico are also the same as yours: governmental and private agencies, the school, social welfare organizations, etc. Most of the work is carried on by government officials, using the same materials which you recommend, but on a smaller or larger scale; the printed matter, the lecture platform, the moving pictures, the radio, and the like. We have been following your steps and our technics are not different from yours for, even though the technics of preventive medicine and public health administration are subject to changes and interruptions, their methods, principles, and objectives are fundamentally alike all over the world, and I believe that it is worth while to tell something about our methods of approaching a people full of prejudices, social and religious superstitions, and well rooted personal habits.

Here a nurse is worried, for the chieftain in a village has forbidden her to vaccinate his people because the weather is too cold or too hot. She is chewing gum, waiting for her bus to take her back to headquarters, defeated. An urchin comes near her and for him she makes bubbles and threads with her chewing gum. The child is amused. Others come and watch her performance. A plan occurs to her: a Chiclet to everyone who lets her vaccinate him. A deal is made with the children and after six hours of exhausting work the whole child population and many adults are protected against smallpox, and another chieftain is convinced that the nurse is not trying to play a mischievous trick on his people. Miss Chewing Gum has in her armamentarium another means to put into action when the chance comes.

Over there, a health officer is refreshing himself in the river near a rural village. The mayor has ordered him to

leave town, notwithstanding a severe outbreak of typhoid fever which is ravaging the place and its surroundings. He is using a cake of scented soap. The foam and the scent attract several little rascals who are watching him. He takes one of them into the water and soaps him. The child is delighted and runs to his hut to show his mother how nice he smells. The squaw comes out to the bank of the river and asks for a piece of that nice soap. "All right, if you allow me to protect you and your family against typhoid fever." The result of such an experience was that the officer had to order several boxes of soap to meet the demand for it in that small rural section, even against the will of its backward mayor.

Besides Miss Chewing Gum, Mr. Soap, Sir Water Supply, we have somebody else who has brought about a big change in communities which were indifferent before to preventive medicine. It is Medical Care. In many places people have never been healthy and to talk to them in terms of health was wasting time. To wake them up and to make them interested in health it was necessary to cure them first and allow them to experience the new sensation of being without the burden of disease. After that it is less difficult to approach them and instruct them how to avoid illness. In many communities it is through curative medicine that the practice of preventive medicine has been established during the last six years. In many rural zones, especially the "Ejidos," or agricultural villages which own their fields, the medical services are supported by the settlers themselves.

I agree with Kleinschmidt that at least in Mexico and in most Latin American countries preventive and curative medicine are inextricably interwoven. The merely hygienic aspects of the fight against malaria or hookworm or any other pestilence which is scourging our rural population cannot be

separated from the purely medical implications. Indeed, as Hydrick<sup>4</sup> and Turner<sup>5</sup> state, a treated patient is only a passive center of health propaganda, as also are his relatives and friends, but I would add that he can become a potential center of the most active health propaganda if we take advantage of his state of mind after he is rid of disease.

A man who has been cured, who for the first time is enjoying health, is willing to do anything you ask him to do, and from a passive tool of education he easily becomes an active instrument for health propaganda. If our systems of health education appear to be weak because we use curative methods, as we are obliged to do in the rural field, it is because we neglect to strengthen them by correlating and coördinating the ancient curative medicine with modern preventive efforts.

To do that, we must change our medical curricula and teach our future doctors and our nurses about the social and economic aspects of medicine. We must teach them that a patient is not an interesting specimen from the economic or scientific point of view, but a unit, a component of a grand complex called society. Then and only then, they will understand that there is only one rational aspect of medicine, the

integral one to perform our duty faithfully.

The events of the past and the facts of the present demonstrate the need of being critical of our programs of education, and particularly of our plans for health education, to establish a sound understanding of the psychology of our people, and a careful self discipline for our own sake and for that of our brethren. In the meantime we must condemn the inner impulse to be defeated beforehand in our efforts to make an end to disease, war, and misery, and to increase the span of human life. Let us do so, and we shall learn to swim in the river of life and enjoy the swimming in a healthy long river, the life of a democratic and free America, in which we do not hesitate to keep our hopes for a better and a happier world.

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# Local Responsibility for Housing Control\*

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MUCH of the emphasis on improving housing for low-income families has been placed recently on large scale, subsidized housing construction projects. Perhaps not enough attention has been paid to improving existing housing facilities, and to preventing the creation of additional slums and blighted areas. More rigid enforcement of existing and strengthened housing laws through mutual coöperation of all local agencies and departments can improve conditions materially in areas of poor housing.

Before substantial improvement of such areas can be accomplished, the problem must be considered from an economic viewpoint. Some time ago a letter was received from an official assigned to study the housing situation in his city. His letter began by saying: "Our Relief Department allows a maximum of \$10 per month for rent, in our relief client's budget." The \$10 a month place unquestionably seldom receives a coat of paint, plumbing repairs by a competent plumber, an earnest effort at rat extermination or rat proofing, heating plant repairs, or other essential maintenance services. The place is rented "as is," and the landlord frequently tells his tenants: "If you don't like it, you can move."

The person of means can move without any great economic hardship. Low income groups, however, usually do not have funds to pay for moving, even if a more suitable place were available for the rent which they are able to pay.

Rental income should be sufficient to enable owners to maintain properties in a reasonable state of repair. Then, municipal departments should enforce requirements for proper maintenance, occupancy, and compliance with building, safety, and zoning laws.

It is generally agreed that housing must be subsidized before substantial improvements can be effected. Federal housing projects are most successful in providing almost ideal housing for low income groups. Municipalities cannot, however, depend upon the federal government for curing all housing ills.

Local control of housing involves three distinct phases, building and zoning regulation enforcement, maintenance supervision, and demolition.

## CONTROL THROUGH BUILDING AND ZONING LAWS

In Milwaukee, it was realized that some control over the conversion of dwellings was essential. This control now involves the securing of an occupancy permit from the Building Inspector whenever there is a change in the type of use of a building. Before this permit is granted, the proposed occu-

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pancy must comply with the zoning, building, safety, and sanitation requirements of city and state codes.

The zoning laws are usually suggested and approved by the Board of Public Land Commissioners before they are enacted by the Common Council. The City Planner is the adviser to and the secretary of this board. Enforcement is by the Building Inspector who is assisted by the Police Department. Police officers post a notice on certain types of vacant buildings, stating that the building cannot be re-occupied without obtaining a permit from the Building Inspector.

City ordinances prohibit any department from issuing permits or licenses involving a new use of a building unless the requirements of the building and zoning laws are first met.

Improper zoning usually creates a problem for the Health Department. Placing too many buildings on a lot leads to crowded conditions which interfere with proper ventilation and light. Noisy, smoky, malodorous industries in the heart of a residential section usually create neighborhood nuisances. Zoning laws will gradually correct conditions existing now because of the lack of zoning control heretofore.

In 1939, at the suggestion of the Building Inspector, a minimum dwelling standards ordinance was passed. This applies to all new or converted buildings which are to be used for dwelling units. The ordinance prescribes minimum sizes of rooms, such as 160 square feet for living rooms, 120 square feet for the first bedroom and 100 square feet for each additional bedroom, and 60 square feet for kitchens.

The minimum dwelling unit must have a total of 280 square feet of floor area. Minimum sanitary equipment is a sink in each unit and one complete bath for each two units. No new light housekeeping units may be created, even in existing buildings or rooming

houses, unless they meet these minimum requirements.

The ordinance prescribes reasonable minimum land areas per dwelling unit. Looking toward the future, this law will do much to eliminate dark, crowded, blighted areas from developing, when what are now new areas are eventually occupied by low income groups.

Blighted areas are developing around the outskirts of cities where building regulations are liberal, laxly enforced or nonexistent. Shacks, bungalow garages, and other makeshift dwellings are erected by the poor. Improperly constructed wells, poorly installed plumbing (if any), and insanitary privies add to the health hazards of poor housing.

Milwaukee county officials state that they were the first in the country to adopt a county-wide zoning law. The county is zoned for agricultural, residential, local business, commercial, light manufacturing, and industrial areas. All subdivision plats are suggested, and must be approved by, the County Planning Department. Zoning permits must be obtained from the county before construction can be started.

All townships within three miles of the Milwaukee city limits have enacted building laws which prohibit the erection of shacks or the use of bungalow garages for more than a limited period of time.

A state-wide well drilling code<sup>1</sup> requiring registration of well drillers, prescribing minimum construction standards, and requiring the filing of a well log and premise diagram, is doing much to eliminate unsafe wells where public supplies are not available. The construction of community wells for subdivisions not accessible to large public water supplies is being encouraged. A state-wide plumbing code is insuring sanitary plumbing installations and reasonably adequate private sewage disposal systems. The Milwaukee Metropolitan Sewerage Commission is pro-



viding sewerage and sewage disposal for a large part of the county. A city ordinance recently enacted, requiring connections with public sewer and water lines when they are available, and requiring sanitary construction and maintenance of privies where sewers are not accessible, will improve housing in outlying sections built before the enactment of county zoning and town building laws.

#### MAINTENANCE SUPERVISION

After a building is constructed or remodeled in accordance with building and zoning requirements and is occupied, the municipality's responsibility is to insure proper maintenance.<sup>2</sup> Routine maintenance is largely a sanitation problem consisting of insuring cleanliness, proper heating, vermin control, and freedom from overcrowding. This, in Milwaukee, is a Health Department function.

Occupancy record cards were prepared for each of the 2,500 licensed rooming houses in the city. Rooming house managers are required to keep a copy of this card posted. Each room or apartment is listed by number. The number of persons allowed in each room or unit is specified. Rooms which do not meet the size and window area requirements of the rooming house ordinance are not listed and are not to be rented. Third floor rooms with inadequate fire exits are not licensed or listed, although enforcement is by the Building Inspector. Crowding is limited to the rather liberal requirements of the old rooming house ordinance. The "Minimum Dwelling Standards Ordinance" previously mentioned, is enforced in rooming houses by specifying whether a room or unit may be used for light housekeeping or whether it must be used for sleeping only. No excuse by an operator for installing cooking stoves in sleeping rooms, for permitting overcrowding, or for renting unlicensed

rooms, contrary to the posted card is accepted.

Health Department inspectors report the inadequacy of fire exits, defective wiring, and similar conditions to the Building Inspector. Illegal plumbing is referred to the Plumbing Inspection Department. Orders are issued directly by Health Department inspectors to correct insanitary plumbing. Copies are sent to the Plumbing Inspector so that he may be sure the work is done under permit. Plumbing hazard surveys in all buildings are made a part of general inspection by Health Department inspectors.

Simple cards are used by inspectors on all routine housing inspections. The cards list all general items relating to building maintenance. Items coming within ordinance requirements are checked "O.K." or "Not O.K." Whenever checked "Not O.K.," orders must accompany the cards. If some item under Building or Plumbing Inspection Department is checked "Not O.K.," form notices are forwarded to those departments.

#### RELIEF AND WELFARE AGENCIES COÖPERATE

In routine maintenance, the coöperation of relief and welfare agencies is especially valuable. The Milwaukee County Department of Public Assistance insists that their clients occupy fit housing units.<sup>3</sup> Rents up to \$40 per month, for large families, are occasionally allowed. Quarters for their clients are rated by their housing department according to their scale. Deductions are made for deficiencies in sanitary facilities, room size, window area, general condition of the building, heating, and the like. Places rating from 85 per cent to 100 per cent are allowed full rent according to their scale. Deductions are made for places rating from 65 per cent to 85 per cent. No place rating below 65 per cent will be rented but is referred to the Health and the Building

Inspection Departments for investigation. They refuse to rent unlicensed rooms in rooming houses.

Insanitary, vermin infested, single family dwellings are also reported to the Health Department. When the Health Department does not have the legal power to order corrections, the quarters may be classed as "unfit for use." The Department of Public Assistance then requires the owner to make the necessary repairs or rent is withheld. Relief and welfare agencies have coöperated by providing furniture to enable families to move from crowded, furnished quarters in multiple family units to more desirable unfurnished, approved dwellings.

The Department of Public Assistance employs a housekeeping instructor who teaches untidy tenants all they can absorb to improve their housekeeping methods, including technic of vermin extermination in private buildings where the Health Department cannot require the owner to exterminate.

The Relief Department's success is due largely to their willingness to pay reasonably adequate rent, directly to the landlord. As the owner knows that his rent will be paid promptly each month, relief clients are, in this respect, more desirable than other low-income families.

#### SOCIAL CENTERS AND SOCIAL AGENCIES

Milwaukee's extensive system of playgrounds, recreation and social centers can be considered a factor in improving the environment in some areas. Within recent years, the number of playgrounds has been increased from 24 to 80. Organized playground activities assist in providing healthful recreation for the children in the crowded and blighted areas. The social center programs, besides providing the usual recreation, offer facilities for special evening activities for young people from homes where proper quarters for entertainment are

not available. These activities are more extensive in areas where juvenile court records show the greatest percentage of minor delinquency.

The social agencies take an active interest in housing. For more than a year, the Housing Committee of the Council of Social Agencies has been studying housing problems from all angles.

#### CONDEMNATION AND DEMOLITION

Before orders are issued to correct conditions in buildings in poor structural condition, the Building Inspector is requested to determine whether the building is subject to condemnation.

Although Milwaukee's tenement law, enforced by the Health Department, contains the familiar condemnation section, with provision for condemnation placards, this clause has not been used for several years. Condemnation is a Building Department duty.

When old sheds, barns, and abandoned buildings are found by Health Department inspectors to be rat harborage, the Building Department checks to determine whether they may be condemned. In the last 12 year period, 7,337 buildings of all kinds were condemned by the Building Inspector and subsequently razed. Many of these were old sheds and barns, cutting off light and air from living quarters and providing rat harborage. In the condemned and razed buildings were 4,155 dwelling units that were unfit for use.

Much of this condemnation was during depression years when one would expect little rebuilding. Records for the years 1935 to 1937 inclusive show buildings razed assessed at \$469,000. Building permits show new construction on these lots to have a value of \$3,546,000. Contrary to the general belief, the city's assessable property values were increased rather than decreased as a result of condemnation.

Condemnation proceedings have a

good effect on general building maintenance. Undoubtedly the number of buildings condemned would have been substantially greater if owners had not realized that they must keep buildings repaired or tear them down.

WPA real property surveys have been made in Milwaukee as in many other cities. Their records show that according to their standards an average of 13.8 per cent of the buildings in 202 other cities are unfit for use. Their report for Milwaukee shows 0.7 per cent of the buildings as unfit for use.<sup>4, 5</sup>

It is reported that when federal authorities studied Milwaukee housing conditions, they agreed that there was no single area that should be cleared to permit the development of a housing project. The one housing project of 518 units in the city of Milwaukee, built under PWA, is located in an outlying area. Early federal housing requirements, making certain minimum incomes mandatory, and placing the rent beyond the means of the poor, have done much to discourage further federal housing projects in the city.

There is no housing authority in Milwaukee, although state laws permit the creation of one. By coöperation, the planning, building, health, relief, social center, and welfare agencies in Milwaukee have made progress toward improving housing.

City health, building, planning, and tax departments are coöperating with the ward alderman in a study of housing conditions and factors in what is probably the most blighted section of the city, the colored district. These departments are also coöperating with the Wisconsin Anti-Tuberculosis Association in their large scale intensive tuberculosis study of the colored people. Possibly the results of this work will be conclusive enough to warrant prompt public action. This may be an area for large scale demolition and a public housing project.

"Neighborhood Re-development Corporations,"<sup>6, 7</sup> similar to those being developed in some other states, might also prove successful in reclaiming certain blighted areas.

Difficulty in obtaining loans for extensive improvement of and for remodeling older buildings is one factor hindering progress. Liberalization of federal lending agencies' policies or the creation of local public loan funds would do much to improve living conditions in many older buildings. Public or subsidized privately built housing on vacant, city owned property, even though large areas for large, complete developments are not presently available, might be desirable in certain districts.

Landlords should do more to encourage tenants to make repairs, do painting and other maintenance. Too many tenants in low-cost housing fear an increase in rent if their quarters or premises "look too good."

Perhaps, with the present emergency, progress in improving housing will be retarded. Defense booms should not necessitate lowering standards too far. Public and private agencies should look forward to utilizing much of our national energy and resources after the emergency to building, reconstructing, and improving housing. In such programs improvements for existing buildings should not be overlooked because of concentration on new projects alone.

Health departments, while they cannot and should not expect to do the whole job, can assume a position of leadership in encouraging coöperation between all interested departments and agencies in the important task of providing improved housing in the communities they serve.

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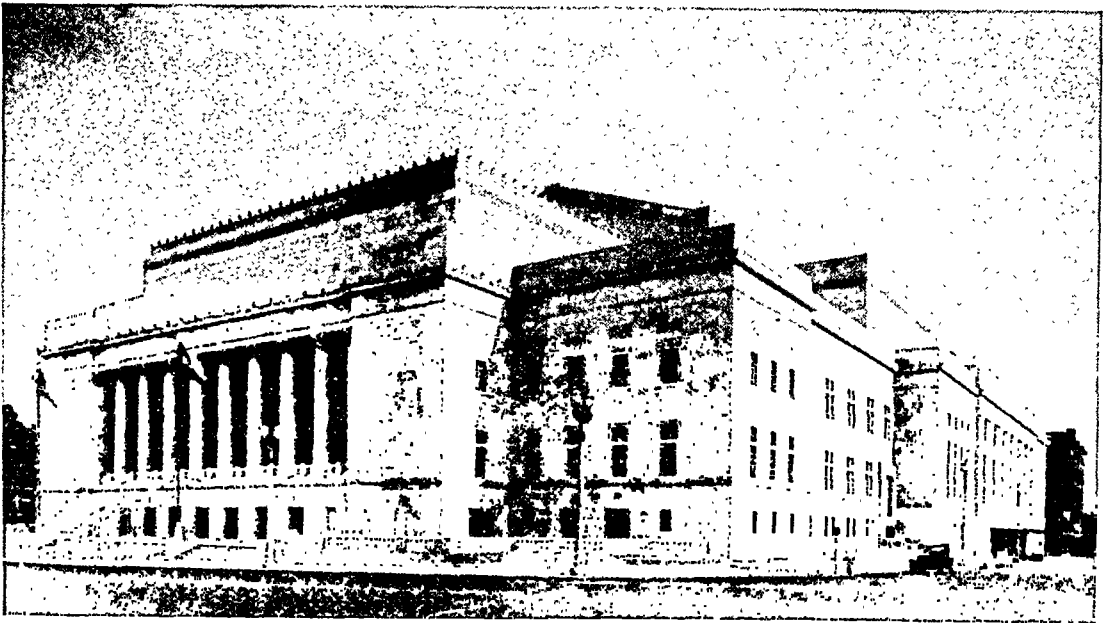
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# Epidemiology of Lye Poisoning in the United States

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IN 1927, culminating the years of continuous struggle of Dr. Chevalier Jackson, a national law was enacted requiring the label "poison" to be placed on all commercial products containing lye and other caustic chemicals. In spite of similar laws enacted by the various states before and after this date, burns due to lye ingestion with resultant esophageal strictures continue to be a serious public health problem. Thus Vinson (1927) reported that 102 of the 186 esophageal strictures seen at the Mayo Clinic were due to the ingestion of lye. Taylor reports 53 lye poisoning cases in Pennsylvania for the year 1934. He also points out that many new caustic preparations have been placed on the market since the Federal Caustic Act was enacted—such household helps as drain pipe cleaners, paint brush cleaner, and paint remover. However, his data indicate that in spite of these new preparations, and increased advertising, lye cases have been reduced somewhat in number.

Martin and Arena (1939) reported a study of 48 cases of esophageal strictures seen at Duke University Hospital in the preceding eight years. It is evident from their report that lye ingestion continues to be an important source of esophageal strictures. Legislation has failed to eliminate this problem. A part of the difficulty arises from the fact that

the Federal Caustic Poison Act (1927) in referring to lye defines dangerous caustic or corrosive substances as any containing 10 per cent or more of sodium or potassium hydroxide. Products used for household purposes containing such amounts of lye must be labeled poison. Products containing less than 10 per cent lye do not come under the Act.

Lye poisoning is not one of the diseases which is required by law to be reported. A number of reports of lye poisoning are scattered throughout the literature, but fail to give an adequate picture of the extent of the problem in the United States. The present study has attempted to gather these data in order to form a basis for rational preventive procedures.

## METHODS

An attempt was first made to ascertain lye ingestion morbidity and mortality from records of the country's 48 state health departments. Practically no detailed information was secured from this source in view of the fact that, although lye poisoning is a reportable entity as a cause of death, in state summaries it is included under the general heading "acute accidental poisoning by solids or liquids." Deaths due to lye ingestion are usually not reported as such but grouped as "accidental

poisoning" or merely "stricture of the esophagus." Frequently no mention of causative agent is given. Lye poisoning morbidity is not required by law to be reported to the health authorities.

Inasmuch as state vital statistics records provided such a paucity of data, it was decided to send questionnaires to a number of hospitals in each state. Letters were written to four or five or more of the larger and more prominent hospitals in each state. They were requested to send data on the total number of lye cases treated each year, together with the total hospital admissions. Data were also requested upon the race, sex, age, and financial status of the patient while in the hospital. The larger and more prominent general hospitals only were questioned, because it was felt they would furnish more data, their records would be more available, and it appeared possible that lye stricture cases would gravitate to them. It is recognized that the hospital samples and data are not entirely representative inasmuch as small hospitals, due to the inadequacy of their records, were not included in the study. It was thought that case duplication might be a complicating factor if numerous small hospitals were also included in the study. The hospitals responded admirably, and some data were received from most of them. Our data are admittedly incomplete both in numbers and desired detail. To our knowledge, however, they represent the first attempt to study the problem on a nation-wide scale.

#### RESULTS

##### *Distribution of Lye Poisoning in the United States*

A total of 1,334 cases of lye poisoning were reported in a total of 9,184,055 hospital admissions by the 181 hospitals during 1914 to 1939, inclusive. Therefore, for the 181 hospitals as a whole over the period studied, lye poi-

soning accounted for 14.5 per 100,000 of the hospital admissions. The year in which the lye poisoning occurred was given in 1,031 of the 1,334 cases reported. They are tabulated in Table 1. A casual inspection of this table suggests a gradual increase in cases. Whether or not this is real cannot be stated, as the yearly admission figures for the hospitals reporting these cases are not available. Part of the increase in reported cases is no doubt due to improvement in hospital records. It may also be due in part to increased bed capacity of some of the hospitals and to the trend toward hospitalization in the United States. It is apparent, however, that the Federal Statute enacted in 1927 did not eliminate lye poisoning. The average yearly number of cases reported by the hospitals in the study group from 1920 to 1927 was 22, while from 1928 to 1939 it was 67. There were 303 lye cases reported without information on the year of their occurrence. Whether or not these cases had a peculiar time distribution which would affect the trend in Table 1 is unknown.

TABLE 1

*Cases of Lye Poisoning Reported by the 181 Hospitals Coöperating in the Study*

1914	.....	1	1927	.....	27
1915	.....	1	1928	.....	29
1916	.....	10	1929	.....	36
1917	.....	12	1930	.....	42
1918	.....	14	1931	.....	59
1919	.....	12	1932	.....	55
1920	.....	18	1933	.....	61
1921	.....	19	1934	.....	83
1922	.....	19	1935	.....	81
1923	.....	18	1936	.....	107
1924	.....	23	1937	.....	103
1925	.....	29	1938	.....	85
1926	.....	24	1939	.....	63

During the period 1914-1939 the 181 hospitals included in this study admitted 1,334 cases of lye poisoning among a total of 9,184,055 hospital admissions. In the year 1939 there were 9,879,244

hospital admissions in the United States. If the proportion of lye poisoning cases to the hospital admissions in 1939 remained the same as it was during 1914 to 1939 it follows that in 1939 there were at least 1,430 new cases of lye poisoning in the United States. However, since our study included data only from general hospitals, whereas the total hospital admission for 1939 includes hospitals for the insane and tuberculous, it is very likely that the total cases of lye poisoning would be less than 1,430. These figures represent only those seeking hospital care. There are no doubt many cases which did not come to the hospital but were treated by physicians in their offices.

The geographic distribution of the cases reported by the 181 hospitals included in this study is shown in Table 2. On the basis of experience in these institutions, hospital admission rate for lye poisoning cases per 100,000 patients is given for each state. The State of Utah had a rate of 411.8 cases of lye

poisoning per 100,000 hospital admissions. The data from this state were too few, however, to be of any significance. Study of Table 2 shows that, except for the District of Columbia with a rate of 111.7, the southern states Tennessee, North Carolina, Florida, South Carolina, and Georgia have the highest rates (61.4 to 85.9 per 100,000 hospital patients). On the other hand, Mississippi with a rate of 8.0, and Louisiana with 13.7, are typically southern states with low rates.

The hospitals queried in 7 states—Rhode Island, Vermont New Hampshire, North and South Dakota, Nevada, and New Mexico—did not report a single case of lye poisoning in a total of 449,886 hospital admissions (Map I).

Pennsylvania reported the greatest number of lye cases, 283. As they were distributed among 1,681,711 hospital patients, the lye poisoning rate was only 16.0 per 100,000. It is quite possible that Pennsylvania's rate as well as the rates of other states, with physi-

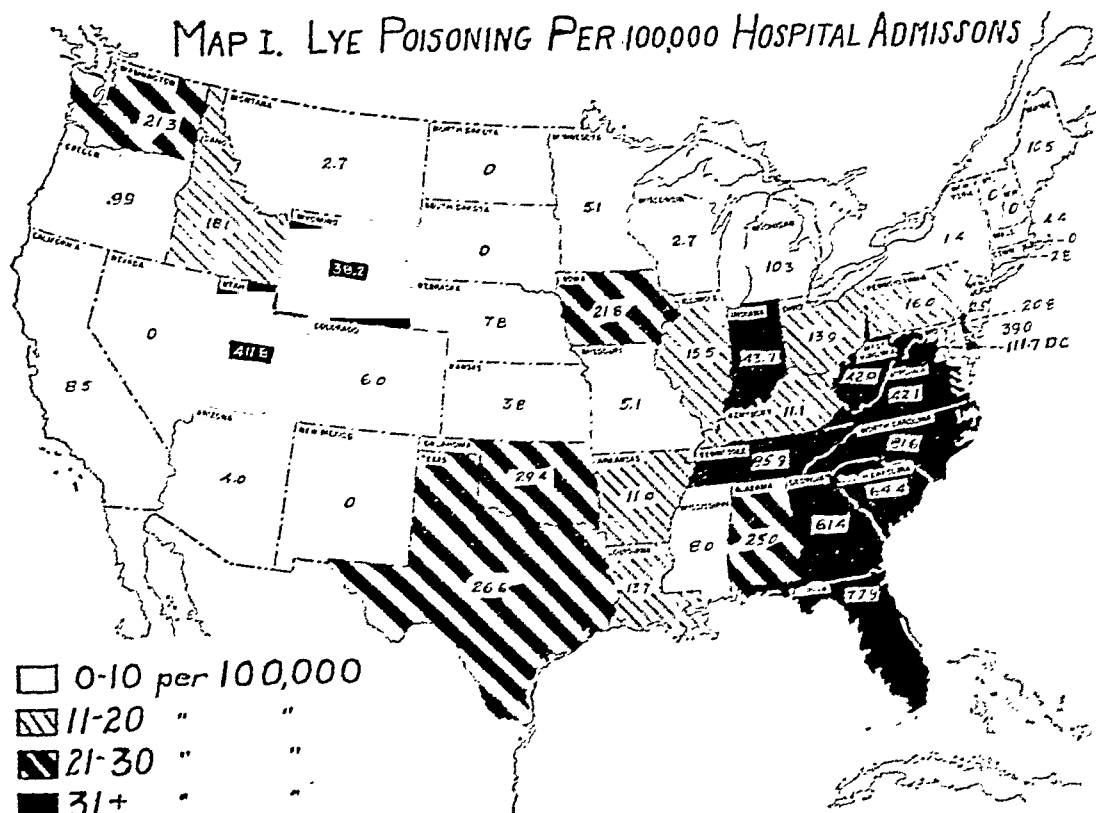


TABLE 2

*Number of Lye Poisoned Cases Reported by the 181 Questionnaired Hospitals in 48 States and the District of Columbia from 1914 to 1939*

State	Number of Lye Cases in Hospitals	Total Number Hospital Admissions	Lye Cases per 100,000 Hospital Admissions	Adjusted Lye Poisoning Rate
Utah	3	679	411.8	144.1
District of Columbia	95	85,950	111.7	111.7
Tennessee	35	40,782	85.9	20.6
North Carolina	60	73,391	81.6	20.4
Florida	67	85,961	77.9	21.8
South Carolina	54	82,347	64.4	14.1
Georgia	43	70,058	61.4	15.4
Indiana	14	31,910	43.7	12.7
West Virginia	3	7,149	42.9	13.3
Virginia	32	76,084	42.1	12.2
Delaware	16	41,283	39.0	15.6
Wyoming	20	52,319	38.2	15.7
Oklahoma	64	218,397	29.4	5.9
Texas	33	124,081	26.6	6.9
Alabama	12	48,458	25.0	5.0
Iowa	82	377,033	21.8	7.2
Washington	1	4,465	21.3	9.3
Maryland	18	86,610	20.8	8.3
Idaho	1	5,500	18.1	7.4
Pennsylvania	283	1,681,711	16.0	5.6
Illinois	75	488,066	15.3	5.7
Ohio	71	511,498	13.9	4.2
Louisiana	9	65,275	13.7	5.6
Kentucky	21	189,364	11.1	2.3
Arkansas	2	17,185	11.0	1.7
Maine	6	56,733	10.5	3.6
Michigan	78	755,308	10.3	3.6
California	28	330,450	8.5	3.5
Mississippi	2	25,075	8.0	1.7
Nebraska	4	50,812	7.8	2.1
Colorado	9	147,750	6.0	2.9
Missouri	14	273,724	5.1	1.6
Minnesota	18	336,251	5.1	2.4
Massachusetts	28	640,969	4.4	1.9
Arizona	1	25,100	4.0	1.7
Kansas	3	79,700	3.8	1.2
Connecticut	3	107,731	2.8	1.2
Wisconsin	10	365,616	2.7	1.1
Montana	2	72,825	2.7	1.4
New Jersey	2	77,931	2.5	0.9
New York	11	799,452	1.4	0.6
Oregon	1	103,286	0.99	0.4
Rhode Island	0	57,051	0.0	0.0
Vermont	0	129,208	0.0	0.0
New Hampshire	0	58,923	0.0	0.0
South Dakota	0	27,934	0.0	0.0
North Dakota	0	127,315	0.0	0.0
Nevada	0	22,983	0.0	0.0
New Mexico	0	26,472	0.0	0.0

cians and hospitals noted for the care of esophageal obstructions, is unduly great due to influx of patients to these centers. The data furnished by the hospitals unfortunately were not sufficiently detailed to permit us to allocate patients to place of origin. Hence it is impossible to estimate the effect of this factor on the lye poisoning rates of the various states.

It is perhaps somewhat illogical to

calculate lye poisoning rates upon hospital admission rates. The hospitalization rate varies greatly from state to state. For example, in Washington, D. C., the yearly hospitalization rate is 19 per cent of its total population, in Georgia it is 5 per cent. It is evident that such great variations in hospital rates in part, at least, indicate that there is a tendency in certain areas to go to the hospital for many illnesses



rather than to remain at home. For certain serious conditions such as operations and lye strictures, it is quite likely that hospitalization rates are rather uniform throughout the country. Variations in the general hospitalization rate influence greatly the ratio of lye poisoning admissions to total admissions. Thus, if the southern states have a low per capita general hospitalization rate, yet if all the lye poisoning cases go to the hospital the lye poisoning admission rate would be relatively high. On the other hand, a state with a high general hospitalization rate would have a correspondingly lower ratio of lye poisoning admissions to general admissions.

A correction was therefore made for the variation in general hospitalization rates in the several states. This was done by multiplying the hospital admission rate\* of the state by the lye poisoning admissions rate. Thus states which had a high lye poisoning admissions rate due to the fact that the general hospital admission rate was low, showed a reduction in the final lye poisoning rate. For example, in North Carolina the lye poisoning cases admitted to the hospitals queried represented 81.6 per 100,000 of hospital admissions. Now North Carolina has a relatively low general hospitalization rate which in turn results in relatively higher lye poisoning rates. The adjusted lye poisoning rate for North Carolina becomes 20.4. The adjusted rates for the various states are shown in Table 2. This correction in general resulted in a reduction in the lye poisoning rate in southern states with a low general hospital admissions rate. Even with this correction the southern

states still showed the highest lye poisoning rates.

Grouping of the lye poisoning into the generally used nine divisions of the United States further emphasizes the more common prevalence of this condition in the South (Table 3).

TABLE 3

*Hospital Admission Ratio for Lye Poisoning per 100,000 General Hospital Admissions in Nine Areas*

	Cases
New England States	2.4
Pacific States	6.8
West North Central States	9.3
Mountain States	10.1
East North Central States	11.1
Mid Atlantic States	11.6
East South Central States	23.1
West South Central States	25.4
South Atlantic States	34.9

#### RACE

There were only 349 cases upon which data were available as to age, race, and sex (Table 4). A total of 249 cases were white (71.6 per cent), and 100 (28.4 per cent) were colored. Inasmuch as the Negro race constitutes approximately 12 per cent of the total population in the United States, and yet appears to account for 28.4 per cent of the lye poisoning cases, it is apparent that this condition is more common among them than among the whites. This is especially apparent if one compares the ratio of lye poisoning reported among white and Negro children under 5 years of age (Table 4). In this particular group, 61 per cent of the cases occurred in white children, and 39 per cent in Negro children. In other words, it was 4 times as common in Negro children as in white children when the racial populations are taken into consideration. Ignorance, crowded living conditions, and carelessness are no doubt factors in the high Negro rate. Another factor responsible for the high Negro rate is their rural distribution.

\* The hospital admission rate of the District of Columbia was 0.19. Since this hospital admission rate was the highest encountered, it was given the value of 1.0 for computation of the adjusted lye poisoning rate, and the other states' calculations were made accordingly.

AGE

Lye poisoning is 2 to 3 times as prevalent among rural persons as urban inhabitants. This is largely due to the habits of house cleaning and soap making of rural southern inhabitants.

Our figures indicate that the greatest percentage of the lye poisoning in both races occurs in the group under 5 years of age. Sixty-five per cent of Negro cases occurred in children under 5 years of age. In the whites, on the contrary, only 41 per cent occurred in children under 5 years of age (Table 4). Two possible explanations are suggested both of which may play a rôle in this age distribution of lye poisoning. The amount of lye swallowed by Negro children may be greater than that usually swallowed by white children and therefore medical and hospital care are sought at once. Among both the whites and Negroes there may be instances where the amount of lye swallowed is so small that hospitalization is not immediately necessary. Hospitalization may therefore come a number of years later due to a slowly progressive stricture. In such instances the case might be classified under the age of onset rather than the age at which the lye was ingested. In fact a number of our records indicate the lye stricture for which the patient was hospitalized dates to lye ingestion some years previously. A second possibility accounting for the higher lye poisoning incidence in whites

in later life is the more common use of this material for suicidal purposes by the white race.

An analysis of the age incidence of lye poisoning in the 0-4 age group demonstrates that children under 1 year of age seldom are affected. One and 2 year olds are the ones most commonly poisoned, although all ages through the 5-9 year group furnish numerous cases. The frequency of attack then falls off until the 20-24 year age group is reached. Beginning at this age and extending through the next 40 years there is a continuous moderate amount of lye poisoning, especially among the whites. This increase in lye poisoning in adults may in part be due to late manifestations of lye poisoning incurred in childhood. Our data, however, indicate that a considerable amount originates in adults and to a large extent as a result of attempted suicides.

There were 60 persons over 12 years of age whose history gave the method of poisoning. In only 3 instances, 5 per cent was "accidental" definitely given as the cause of lye ingestion. There were 5 cases which were called "recent" and possibly all of these 5 could have been accidental—though this is not probable. Should one consider, however, all of these "recent" cases due to accidental cause, even then lye accidents by adults, in this case over 12 years of age, would amount to

TABLE 4  
*Distribution of Lye Poisoning by Age, Sex, and Race*

Age		Under 1	1	2	3	4	0-4	5-9	10-14	15-19	20-24	25-34	35-44	45-54	55-64	65+	Adult	Infant	Under 4	Total
White	Male	0	16	13	10	11	50	6	3	2	7	10	14	11	4	2	7	0	4	120
	Female	2	18	20	4	3	47	7	2	15	14	14	9	7	7	2	4	1	0	125
	Total	2	34	33	14	14	97	13	5	17	21	24	23	18	11	4	11	1	4	249
Negro	Male	1	4	12	7	5	29	7	4	1	1	3	2	1	0	0	3	0	1	53
	Female	0	14	11	7	1	33	1	1	1	2	3	3	2	0	0	0	0	1	47
	Total	1	18	23	14	6	62	8	5	2	3	7	4	3	0	0	3	0	2	100
Total		3	52	56	28	20	159	21	10	19	24	31	28	21	11	4	14	1	6	349

only 13.3 per cent—quite different from the 100 per cent accidental ratio found in the study of lye cases in children. To sum up the adult lye poisoning cases we find 66.7 per cent of them were due to suicide, 20 per cent were poisoned as children, and possibly 13.3 per cent were accidentally poisoned as adults (Table 5). In the study of adult cases (over 12 years of age) at Duke Hospital, where a more careful investigation could be made of the method of poisoning (but with the disadvantage of having far fewer cases), it was found that 18.2 per cent of adults had taken lye by accident as an adult, 45.4 per cent had taken lye by accident as a child, and 36.4 per cent used lye with suicidal intent (Table 6).

TABLE 5

*Summary of Accidental and Suicidal Lye Poisonings in Persons Over Twelve Years of Age*

<i>Reason for Poisoning or Time When Poisoned</i>	<i>No. of Cases</i>	<i>Per cent of Total</i>
Suicide	40	66.7
Poisoned "when child"	9	15.0
"Old" cases	3	5.0
"Recent" cases	5	8.3
Poisoned by "accident"	3	5.0

20.0%  
as  
children  
13.3%  
probably  
accidental

TABLE 6

*Analysis of Eleven Lye Cases at Duke University Hospital in Persons Over Twelve Years of Age*

<i>Reason for Poisoning or Time When Poisoned</i>	<i>No. of Cases</i>	<i>Per cent of Total</i>
Poisoned "when child"	5	45.5
Suicide	4	36.4
Poisoned by "accident"	2	18.2

A total of 40 instances of suicide by lye ingestion were reported. Thirty-eight (95.0 per cent) of the 40 suicide cases were white, 2 (5.0 per cent) colored. White females were responsible

for 22 (55.0 per cent) of the suicides, white males for 16 (45.0 per cent), colored females and males each responsible for 1 (2.5 per cent). Since lye is a substance used more often by the poorer classes, it is not surprising that 70 per cent of these suicidal cases entered the hospitals as charity patients, while only 14.6 per cent were private patients. The financial status of 15.4 per cent of the patients was not given.

## SEX

Lye poisoning as reported was slightly more common among white females than males and more common in Negro males than among Negro females. Our data show that among the whites, 48.2 per cent of the cases were males and 51.8 per cent females, among the Negroes 53.0 per cent were males and 47.0 females. It is impossible to state why the rate for white males should be less than that for the females while among the Negroes the males had a greater lye poisoning rate than the females. The difference in lye poisoning rates of the sexes is very small, however, and more data are needed before any significance can be attributed to these apparent differences. One might have expected a higher rate among the females than the males inasmuch as the former spend more time in the home and theoretically should have a greater exposure to accidental ingestion. This may be balanced by the fact the females usually prepare the lye for use, are familiar with it, and hence avoid its accidental ingestion. Study of the incidence of lye poisoning among children under 5 (Table 4) also indicates no appreciable sex difference.

## LYE ACCIDENTS

All the cases of lye poisoning in our series can be placed into two groups: accidental and intentional. The former group includes persons of all ages who

by accident ingested lye. The latter group, taking lye intentionally, were attempting suicide. This latter group is composed almost exclusively of adults.

Accidental lye poisoning was frequently due to ingestion of the powdered lye mistaken for salt or sugar. Even more common was the drinking of lye solutions which were mistaken for milk or sugar water. Classification of 53 cases upon which data concerning the type of material ingested were available indicates that 45.3 per cent of the patients had swallowed lye solution; 24.5 per cent had ingested powdered lye; 30.2 per cent were merely stated to have "swallowed lye."

The following excerpts from lye poisoning case histories indicate how the accident took place.

#### *Powdered Lye:*

- "Lid of lye can put in mouth."
- "Spoon containing lye put in mouth."
- "Pellets of lye swallowed."
- "Picked up lye can and started eating contents."

#### *Lye Solution:*

- "Solution mistaken for drinking water."
- "On wash day."
- "Drank 'sugar water' from glass which once contained lye."
- "Solution of lye and water put on potato and eaten."

Our data and a review of the literature show that lye, or its preparations, have been mistaken for the following: cough mixture, drinking water, sugar, medicine, milk, epsom salts, wine, and coffee.

Histories of the majority of accidental lye poisoning in children indicate that the lye was being used in solution for washing of clothes and floors or making soap. These solutions or lye pellets were carelessly left within reach of children.

Intentional, is to a large extent a problem of families in the low income group. A total of 239 of 284 cases (85 per cent) upon which the financial status of the patient was given were charity patients. Those taking lye for suicidal purposes were charity patients in 70 per cent of the instances. The cost of hospitalization and treatment were assumed by the hospitals, local charity, or local governments. That this expense may be rather great is indicated by the findings of Martin and Arena. They reported that 68 per cent of the lye poisoning cases studied by them required an average of 48 days hospitalization. Sixteen per cent of the patients were hospitalized 1 to 6 days, and the remaining 16 per cent were followed in the dispensary. In addition to the immediate hospital treatment, the patients frequently must return over a period of months and even years for dilatation of esophageal strictures. Thus the total expense of an accidental lye poisoning may be a matter of several hundred dollars.

#### PREVENTION

Our data indicate that the prevention of accidental lye poisoning is largely a matter of eliminating this substance as an accidental item of diet or beverage of children. Children under 5 years of age are especially involved in this problem. Adult and child education would appear to be the first logical step in the prevention of lye poisoning. Education of the adults is important because they are responsible for using the lye preparation and carelessly leaving the material lying about. They should be informed of the usual household chemicals that contain lye or caustic materials and also the grave dangers and consequences of ingesting these materials. In addition to stressing prevention of poisoning, it should also be emphasized that if poisoning does take place, whether the

#### LYE POISONING—AN ECONOMIC PROBLEM

Lye poisoning, both accidental and

burn appears mild or severe, a doctor should be consulted at once. Apparently mild caustic burns frequently result in severe strictures later unless the proper treatment is instituted early. Children should be warned about eating unfamiliar materials or drinking "water" or "milk" that has been standing around. The educational program should consist of an educational leaflet on lye prevention for general distribution by health organizations. Prevention, first aid, and the necessity of medical attention should be stressed. Likewise, placards for school use should be prepared. This material should be distributed especially widespread in rural areas. This material could be prepared by the health departments. Education of Negroes is particularly needed as this race has an unusually high lye poisoning rate.

Education as to the dangers of lye poisoning should be included in the health instruction given in school. Lye preparations should be demonstrated to the children in the classroom to familiarize them with their appearance.

#### SUMMARY

Accidental lye poisoning with resultant esophageal strictures continues to be a problem of considerable impor-

tance. In general, this condition is somewhat more prevalent in the southern states than in the remainder of the United States. It occurs relatively much more frequently in Negroes than in whites, and is more common in rural than urban areas. By far the greatest incidence of lye poisoning is in children from 1 to 5 years of age. Males and females are equally affected. It is rarely encountered in children under 1 year of age.

Months of treatment are necessary for cure of lye strictures of the esophagus. The majority of patients are in the economic group that cannot pay for the extended treatment that is necessary.

Prevention of accidental lye poisoning consists of continuous education of adults and children as to the dangers of ingesting the substance, and the necessity of medical care if lye is ingested.

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# Public Health Planning for War Needs: Order or Chaos?

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TO be bewildered or encouraged—that is the question raised by the rapid flow of press releases on federal public health activities. Are the many changes in national health organization during recent months indicative of confusion and mismanagement or are they signs of healthy adaptability? This question is as vital to public health workers outside the official services as it is to government personnel.

The United States Government *Manuals* rapidly become obsolete in so far as the machinery of public health administration is concerned. Probably some of the observations contained herein will also be obsolete before they are read. However, the long-term goal of present developments is not foggy. Neither are the procedures followed in efforts to harmonize the work of the many branches of government which affect public health as desultory as they might seem to a totalitarian.

The tempered man of experience as well as the tyro asks, "What do they do—this ODHWS? this OCD? What about the Red Cross? What are their functions? Where does the Children's Bureau come in?"

A major development has been the creation and the rapid growth of the

Office of Civilian Defense (May 20, 1941) and of the Office of Defense Health and Welfare Services (September 3, 1941). Both, along with many other divisions, boards, and offices, are in the Office for Emergency Management, which is directly under the authority of the President through his Executive Office. It would not be illogical to include responsibilities of the Office of Price Administration and the Division of Priorities if one were being all-inclusive about the protection of health in the nation at war. Contributions to public health from the Office of Scientific Research and Development are highly significant also. The present discussion, however, is confined to the Office of Defense Health and Welfare and to the Office of Civilian Defense, two organizations which are working more directly with public health problems as they are more usually conceived even in their broader aspects.

Inevitable shifts in needs require reconstruction and invention of machinery. Public health problems in America are profoundly affected by the vast movements of population and wealth which are occurring. Not only geographic transpositions but also inevitable vocational and avocational re-alignments are produced by sudden and drastic changes in the immediate goals of the great majority of those human beings who are the American People.

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Accelerated needs in public health run in two directions: first, those changes in emphasis in and continued development of the regular public health services which have expanded rapidly since 1935; second, preparation for local emergencies which arise from enemy action. Although there is interlocking, perhaps some overlapping, and also wide variation of operations as they affect local communities, the Office of Defense Health and Welfare Services seeks, by and large, to cope with the first and the Office of Civilian Defense with the second.

That both of these Offices also render many other services not directly concerned with public health is a significant sign of the times. The medical and engineering phases of public health are still the easiest to understand and are of first importance in the event of enemy action. However, the wide economic, sociological, psychological, and legal bases on which the well-being of the country rests are now placed in an administrative perspective which indicates imagination and courage.

#### OFFICE OF DEFENSE HEALTH AND WELFARE SERVICES

*Organization*—The Office of Defense Health and Welfare Services, directed by Paul V. McNutt, superseded the Office of the Coördinator of Health, Welfare, and Related Activities. The Office utilizes the facilities of the central Federal Security Agency services, such as legal counsel, personnel and business management, and information service. Its Interdepartmental Advisory Council is composed of representatives from 20 federal agencies, including the constituent agencies of the Federal Security Agency (Office of Education, Public Health Service, Social Security Board, National Youth Administration, and Civilian Conservation Corps) as well as other federal agencies, notably the Children's Bureau. This Council

advises the Director on major policy questions. Committees of specialists in the respective fields from public and private agencies, professional associations, and other interested groups have been set up on Health and Medical Care, Procurement and Assignment Service (for physicians, dentists, and veterinarians), Family Security, Social Protection, and Community Organization.

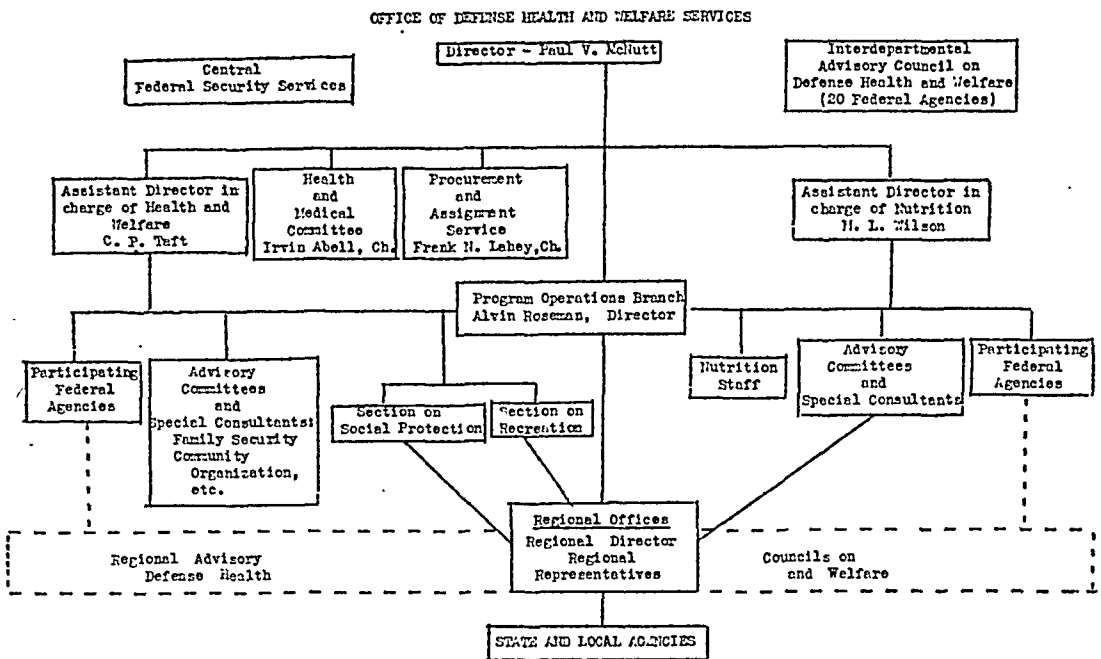
In each of the 12 geographic regions of the Social Security Board there is a regional Advisory Council corresponding in structure and function to the Interdepartmental Advisory Council at the federal level. The regional directors of the Social Security Board act as Regional Directors of Defense Health and Welfare Services and serve as chairmen of the Regional Advisory Councils.

Within the central office there are four main functional subdivisions: Division of Health and Welfare, Division of Nutrition, Health and Medical Committee, and Procurement and Assignment Service. The field programs of the Office of Defense Health and Welfare Services are integrated through the Program Operations Branch, of which Alvin Roseman is Director.

The Division of Health and Welfare is under the direction of Charles P. Taft, Assistant Director, and Geoffrey May, Deputy Assistant Director. In addition to its planning activities, the Division of Health and Welfare conducts its operations through the Public Health Service, Office of Education, Social Security Board, Recreation Section, and Social Protection Section.

The Division on Nutrition is under the direction of Milburn L. Wilson, Assistant Director, and William H. Sebrell, M.D., Deputy Assistant Director. The major activities of the Nutrition Division, which works with the National Nutrition Advisory Committee, the subcommittees on Food and Nutrition and on Food Habits of the

*Diagram of Relationships within the Office of Defense Health and Welfare Services  
and Its Relationship to Some Other Agencies*



F. Sullivan 2.10.42

National Research Council, and the State Nutrition Committees are the organization and conduct of a nation-wide campaign for the improvement of nutritional standards and food habits.

The Health and Medical Committee was established, with the approval of the President, by the Council of National Defense, September 19, 1940. This committee consisted of Dr. Irvin Abell, chairman; the Surgeon General of the Army (Major General James C. Magee); the Surgeon General of the Navy (Rear Admiral Ross T. McIntire); the Surgeon General of the U. S. Public Health Service (Dr. Thomas Parran), and the chairman of the Division of Medical Sciences of the National Research Council (Dr. Lewis H. Weed). The original order establishing the Health and Medical Committee stated:

It will be the responsibility of the committee to advise the Council of National Defense regarding the health and medical activities affecting national defense. In carrying out its functions, the committee may (a)

utilize, to the extent that such facilities are available for such purpose, the laboratories, equipment and services of the Medical Departments of the Army and Navy, of the Public Health Service, and of other government institutions; and (b) within the limits of the appropriations allocated to it, to contract with and transfer funds to such institutions, and to enter into contracts and agreements with individuals or educational or scientific institutions for studies, experimental investigations and reports.

Subcommittees were appointed in these fields: Medical Education, Dentistry, Hospitals, Industrial Medicine, Negro Health, Rehabilitation, and Nursing. These committees gave their attention chiefly to issues of medical and nursing personnel, some of the medical problems of Selective Service, and to many research problems. When the Health and Medical Committee became part of the Office of Defense Health and Welfare Services, created on September 3, 1941, its research functions were transferred to the Office of Scientific Research and Development. Dr. A. N. Richards, Chairman of the Committee



on Medical Research of the Office of Scientific Research and Development, also serves on the Health and Medical Committee of the Office of Defense Health and Welfare Services. Dr. James A. Crabtree, Surgeon, U. S. Public Health Service, is its Executive Secretary.

The Procurement and Assignment Service was established November 1, 1941, to coördinate the various demands on the nation's medical, dental, and veterinary personnel to assure their most efficient utilization. The plans for the service are designed to meet both military and civilian needs. Its detailed functions are:

1. To receive from various governmental and other agencies requests for medical, dental, and veterinary personnel.
2. To secure and maintain lists of professional personnel available, showing detailed qualifications of such personnel.
3. To utilize all suitable means to stimulate voluntary enrollment, having due regard for the over-all public health needs of the nation, including those of governmental agencies and civilian institutions.

The Section on Social Protection, in coöperation with existing state and local agencies, is responsible for safeguarding the armed forces and civilian population from the various hazards of commercialized vice. One of its major concerns is the control of venereal diseases in the armed forces by the suppression of prostitution in the extra-cantonment zones.

Closely related to the work of the Section on Social Protection is that of the Section on Recreation which is responsible for stimulating and coördinating recreational programs in communities adjacent to army, navy, and war-industrial establishments, and assisting such communities to secure supplementary recreational facilities.

#### OFFICE OF CIVILIAN DEFENSE

The Office of Civilian Defense was established May 20, 1941, by Executive

Order within the Office for Emergency Management. James M. Landis succeeds Fiorello H. LaGuardia as Director. The original order was amended by subsequent Executive orders: (1) enlarging the Volunteer Participation Committee; (2) including the American Red Cross among the organizations to be represented on the Board for Civilian Protection.

"The functions of the OCD as defined by Executive Order are to:

- "Coördinate Federal Civilian Defense activities which involve relationships between the Federal Government and State and local governments;
- "Study and deal with problems which arise from the impact of the industrial and military defense effort upon local communities;
- "Assist State and local governments in the establishment of State and local councils or other agencies designed to coördinate civilian defense activities;
- "With the aid of the Board for Civilian Protection, plan and carry out civilian defense programs for the protection of life and property in the event of emergency, including the recruitment of and training of civilian auxiliaries;
- "With the aid of the Volunteer Participation Committee, promote activities designed to sustain the national morale and to provide opportunities for constructive civilian participation in the defense program;
- "Review existing or proposed measures affecting State and local defense and recommend such additional measures as may be necessary or desirable to secure adequate civilian defense.

"The Board for Civilian Protection, whose members serve as such without compensation and advise and assist the OCD Director in the formulation of civil defense programs, is made of representatives of the War Department, the Navy Department, the Department of Justice, the Federal Security Agency, the American Red Cross, the Council of State Governments, the American Municipal Association, the United States Conference of Mayors, and the Volunteer Participation Committee.

"Upon the recommendations of the Board, an Administrative order was issued establishing Regional Civilian Defense Areas and Regional Offices of the Office of Civilian

Defense coincident with the Army Corps Areas. The Division of State and Local Coöperation, previously established as an instrumentality of the National Defense Advisory Commission, was absorbed by the OCD.

"The Volunteer Participation Committee, representative of the various regions and interests of the Nation, was created by the President on July 19, 1941. It comprises 45 members who serve without compensation.

"The Committee as a whole acts in an advisory capacity to the Director of the OCD. Its members, in groups of five, function in a similar capacity as advisors to each of the nine directors of the OCD."\*

The Medical Division of the Office of Civilian Defense, of which George Baehr, M.D., is the Chief Medical Officer, has a Medical Advisory Board and maintains a close relationship with the American Red Cross which has been the chief agency in meeting needs arising from catastrophes, both military and natural, for half a century. There are five groups of activities within the division. These are Emergency Medical Services and First Aid, Physical Rehabilitation, Nursing, Sanitation and Public Health Engineering, and Information Service. The Information Service has two branches—one operating officially and the other through the American Medical Association.

The Medical Division has issued two bulletins for the guidance of local Defense Councils, one July 1, 1941, entitled *Emergency Medical Service for Civilian Defense*, and a supplement in November, entitled *Equipment and Operation of Emergency Field Units*. These bulletins provide specific, detailed recommendations for local organizations. One of them summarizes the division's function thus:

The Medical Division is charged with the preparation of plans for emergency medical service and equipment. . . . Because of geographical and administrative diversity in various parts of the country, general plans

are presented as recommendations to state and local defense councils for adaptation to meet the needs of the different areas. The general adoption of a common pattern in organization and equipment for civilian defense is highly desirable so that adjacent communities may pool or exchange emergency resources in time of need.

*Interrelationships:* ODHWS, OCD, ARC, Children's Bureau—With so many new names and unfamiliar labels, it might appear that disorganized expansion with dislocation of essential services is taking place in public health administration. Such is not the case. Liaison officers from various groups are assigned to serve as consultants on planning committees in related agencies. The value of this policy is indicated by work being done toward definition of functions, by relinquishing certain pursuits to other groups with machinery already geared for action, and by the formation of new groupings when indicated.

For example, the Day Care Programs for Children are made possible by the recent appropriation of \$150,000,000 for "Community Facilities" in defense areas. These projects must be certified by the Children's Bureau and by the Office of Education. State welfare departments will be responsible for their supervision. State and local health departments will in many areas have the responsibility of providing medical supervision and medical service in day-care centers. Volunteers, enlisted through local defense councils, and trained in some cases by personnel from constituent agencies of the Federal Security Agency which carries out much of the program of the Office of Defense Health and Welfare Services, will be essential for their functioning. The American Red Cross also will, in many localities, have much to contribute to this and many other joint programs.

A further example of the ironing out of possible duplication of effort is in the work being done in blood procurement. This job is now being continued

\* Office of Emergency Management Handbook, November, 1941.

exclusively by the American Red Cross. It might well have become a function of the Medical Division of the Office of Civilian Defense, but the fact that the Red Cross does the work because it was already equipped to take the responsibility indicates the values realized by conference and joint planning.

This procedure of delineation of functions has been going on not only incidentally through personal contact, but also in the formulation of carefully thought out statements of policy governing the relationships of the various agencies. In *Victory*, February 3, 1942, appeared the following from a joint agreement reached by the USOCD, ODHWS, and ARC:

The Red Cross, through its Chairman as a member of the Civilian Protection Board, has made available all of its services as needed by the U. S. Office of Civilian Defense and State and Local Defense Councils. As illustrative of its national services, attention is called to the programs involving blood plasma, medical technologists and nursing enrollment. The Office of Civilian Defense and the American Red Cross are agreed that Defense Councils and Red Cross Chapters should develop local plans of coöperation in their civilian defense activities.

Recognizing the basic responsibility of government it is the duty of every Red Cross Chapter and Branch to aid in the most efficient marshalling of the community's resources. It is agreed that duplication should be avoided in these services and training courses required in civilian defense activities and that the long-established nation-wide program of the Red Cross should be utilized to the fullest extent.

That there will be no uniformity of local development or of utilization to the fullest of existing resources goes without saying. In some communities a good job is being done; in others there is lagging. Some communities had ready for use most of the things needed for disaster relief, just as they had smoothly

functioning educational systems and public health organizations. Their job of doing things as well as reaching agreements on what to do and how to do it will be infinitely easier than in those where facilities are not very far along and where experience in coördination is brief. In those communities where the need is acute, both because of emergencies and of underdevelopment, there are special federal services available as well as those of the Red Cross and of other semiofficial and non-official agencies.

Examination of the efforts and achievements made thus far to meet public health needs of the nation at war leaves the impression that there is ample justification for encouragement. Rapid changes involving many phases of complex problems cannot be made without some apparent confusion. But acceleration in the coördination of the social and economic factors with the more obvious medical and engineering aspects of public health far more than compensates for the extra effort that is required in making the necessary shifts.

A joint statement issued May 18, 1942, by the USOCD and ARC supersedes previous ones. With regard to emergency medical services, it states:

"During bombing or other enemy attack, all services are directed from the Control Centers in charge of the Commander of the Citizens' Defense Corps. Responsibility for the care of those injured as a result of enemy action rests with the Emergency Medical Service of the Citizens' Defense Corps under the direction of the Chief of the Emergency Medical Service. . . . During the emergency period, ambulances and motor units assigned to such transportation service will be under the direction of the Chief of Emergency Medical Service or the Transport Officer. . . ."

"After the emergency period the appropriate public agencies are expected to undertake the care of civilians in accordance with plans developed in conjunction with the Office of Defense Health and Welfare Services and the Federal Security Administrator. Funds will be made available for this purpose by the Federal Government through the Federal Security Administrator."

# Integrating Mental Hygiene in County-wide Health Service

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IN considering the services available to the psychopathic case, the following letter is interesting:

Dept. of Health  
Washington, D. C.

Dear Sirs:

My army examination revealed that I had this defect: constitutional psychopathic inferior. In order to treat this, I would like to know just what it means, and all other details that you can give regarding it will be very much appreciated.  
I thank you very much."

The boy who wrote this letter lives in a town of about 10,000 population, so there is slight chance of there being either a mental hygiene clinic or a private psychiatrist to whom he could go for advice in this very disturbing situation which has arisen in his life. Even if he lived in a city of 50,000 to 100,000 the chances would be two-to-one against there being a mental hygiene clinic available to him. In about three-fourths of the cities over 100,000 such a person could obtain help, but if he lived in a rural or semi-rural community it would have to be one of very few for mental hygiene assistance to be available to him. In 15 entire states he could obtain no such assistance.

Neuropsychiatric conditions have been responsible for about 7 per cent of all Selective Service rejections (63,000 men up to May 1 of this year). The great

majority of these rejected men of necessity have gone back to home and community without being referred to any psychiatric or mental hygiene agency which could at least give an explanation and reassurance in the crisis even if unable to do any preventive or curative work. The emotional harm which accompanies rejection by the induction boards of individuals who have already bidden their families and friends goodbye and quit their jobs is very considerable. This situation is doubly unfortunate in the case of persons with previous emotional difficulties who may have been making a rather precarious adjustment anyway.

The total amount of mental hygiene service available to the country is inadequate enough but the fact that only 20 per cent of such services are in small communities, which include 75 per cent of the population, makes it impossible for many individuals with nervous and emotional problems to obtain help. Venereal and other diseases coming to the attention of public health authorities from both Selective Service and other sources are often being referred for appropriate treatment, and a rehabilitation program is being planned for defects which occur in selectees. But these plans cannot include much attention for nervous and mental disorders with existing facilities.

Why has not better provision been made for the type of illness which is responsible for half of all disability? It

\* Read before the Southern Branch American Public Health Association at the Tenth Annual Meeting in St. Louis, Mo., November 11, 1941.

is largely due to the fact that the development of mental hygiene service has been left to voluntary and non-health governmental agencies where development to an adequate level has been illogical and difficult. Illogical because mental and emotional illnesses are primarily matters of public health medicine closely bound up with so-called physical or organic conditions which have been accepted as health problems. Difficult because of the scarcity of trained specialists needed and the fact that most communities are not large enough to support a full-time mental hygiene clinic, and no higher agency has undertaken to organize part-time service to groups of communities. Unreasonable stigma and prejudice rooted in past superstitions attached to mental illnesses have contributed to the indifference of the public in general and of physicians concerning mental hygiene.

It is usually at the county level where public health services meet the public. The establishment of mental hygiene work as one of the county health services (except of course in those areas where the population is concentrated into larger cities) should be the object of mental hygiene plans whether the planning is done at a state or national level. The county health department is established in the community with close relations with the school and welfare agencies, private medical practitioners, and parents, the most important sources which will send requests for mental hygiene consultation. People will come and bring their children with confidence and hope to the same health center where they have obtained other health services.

Only counties with a population of 100,000 to 150,000 need full-time mental hygiene units. Smaller counties should each have the services of a mental hygiene clinic one day a week for each 20,000 to 25,000 population.

The usual mental hygiene unit con-

sists of one psychiatrist, one psychologist, two psychiatric social workers, and one clerk. Such a group, because it is small and needs no heavy or bulky equipment, is readily mobile, requiring only one ordinary automobile for transportation. Nurses attached to health units if they have adequate training in psychiatric social work can take the place of traveling social workers. The responsibility for organizing part-time traveling service to counties belongs in most states to the state health department.

Some idea of the magnitude of the mental health problem and the types of cases encountered is shown in Table 1. The data from these two communities, one an urban area and one a rural county, each with approximately the same proportion of Negroes, show a close agreement in the total figures for mental health problems, although the classification system used differs somewhat. Both studies give an incidence rate for mental health problems of approximately 7 per cent. Not all of these will come to the mental hygiene clinic for attention, since some are already receiving care; most of the psychotics will be in state hospitals, many of the defectives will be in state schools, and some of the delinquents will be in penal institutions. Others will not seek or accept help.

About 25 per cent of the psychotics, according to experience in the Eastern Health District,<sup>1</sup> still will be in the community, and this is not necessarily a bad condition if they are under the care of a mental hygiene clinic, which may be able to prevent their commitment, or their recommitment in the case of parolees from the state institutions. In a recent analysis of 100 cases of recovered schizophrenia, Dr. Thomas Rennie wrote: "The most striking single factor for recovery seems to be a long term contact with a physician or a clinic. These patients are capable of

TABLE I

*Classification and Incidence of Mental Health Problems in Two Communities*

<i>Williamson County, Tenn.*</i> 1938, Population 25,000 (23% Negroes)			<i>Eastern Health District, Baltimore, Md.†</i> 1933, Population 56,000 (22% Negroes)		
Classification	Cases		Classification	Cases	
	Number	Rate per 1,000		Number	Rate per 1,000
"Active" Cases	914	36.8	Psychotic	335	6.0
Psychotic and Post-psychotic	121	4.9	Post-psychotic	67	1.2
Psychoneurotic	89	3.6	Psychoneurotic	112	2.0
With Conduct or Behavior Disorder	285	11.5	Epileptic	42	0.7
With Psychopathic Traits	152	6.1	Psychopathic	73	1.3
With Special Personality Type	208	8.4	Maladjusted, delinquents and defectives not included in above	3,167	56.5
Mentally Retarded	19	0.8			
With Organic Conditions, Handicapped, Miscellaneous	40	1.6			
"Inactive" Cases	807	32.5			
Post-psychotic	35	1.4			
Formerly Psychoneurotic	10	0.4			
Formerly with Conduct or Behavior Disorder	129	5.2			
With Psychopathic Traits	54	1.4			
With Special Personality Type	126	5.1			
Mentally Retarded	184	7.4			
With Organic Conditions, Handicapped, Miscellaneous	289	11.7			
Total Cases	1,721	69.4	Total Cases	3,796	67.7

\* Roth, W. F., Williams, W. C., and Luton, F. H. The Relationship of Mental Hygiene to a Local Health Department Program. To be published in *A.J.P.H.*

† Cohen, Bernard M., and Fairbank, Ruth E. Statistical Contribution from the Mental Hygiene Study of the Eastern Health District of Baltimore, I. General Account of the 1933 Mental Hygiene Survey of the Eastern Health District. *Am. J. Psychiat.*, 94, 5:1153-1161 (Mar.), 1938.

accepting guidance and of resolving personal conflicts with the help of the psychiatrist."² It has been estimated that as high as 20 per cent of the patients in state hospitals without social service or outpatient follow-up could be paroled if some psychiatric or mental hygiene agency existed in the community to supervise them.³ Parole supervision is a very helpful and economical co-operative enterprise with state hospitals.

The mental hygiene clinic should take the place of the courtroom and the jail in the treatment of some alcoholics. Austin H. MacCormick at a recent meeting of the Research Council on the Problems of Alcohol said: "As soon as possible the care and treatment of alcoholics should be taken from our penal and correctional systems and turned over to state and local departments of

health or hospitals, depending on the particular situation in any jurisdiction. Only when alcoholism is treated as a problem of public health and mental hygiene, rather than of law and penology, and the alcoholic considered a sick person in need of treatment, rather than an offender in need of punishment, will we put an end to our present record of almost complete failure."⁴ The courts have many cases besides alcoholics for whom they would appreciate psychiatric consultation.

The schools and welfare agencies will refer most cases which come to the mental health clinic. Children referred offer the best opportunity for preventive psychiatry, but psychiatric consultation for adults referred by welfare agencies, for example, may result in whole families going off relief. Most counties have no

psychiatrists in private practice. General physicians sincerely appreciate the help they can obtain by referring what they consider the most undesirable element among their patients to the mental hygiene clinic. Recent literature contains numerous estimates as to the proportion of patients coming to the general practitioner who have an important emotional component. The most recent figures seen come from a London survey<sup>5</sup> which found that the psychic factor was important in the illnesses of 80 per cent of all hospital admissions, and that in any group of sick people something like 30 per cent are suffering from conditions for which it would be helpful to have psychiatric advice.

Each case referred to the mental hygiene clinic gives opportunity for more palatable instructions in mental hygiene principles than is possible by more formal methods; this educational work is probably the most valuable long-range part of the mental hygiene effort.

An outline showing the most important aspects, both clinical and educational, of a county health department mental hygiene program appears as Table 2. This is taken from the Williamson County, Tenn., mental hygiene program which has been functioning about 6 years. For the first 5 years it was carried on as a survey program from which several interesting papers have come. In the latter part of 1940 it was reorganized with the emphasis on community service looking forward to its extension to other areas of the state.

Clara Bassett, the author of *Mental Hygiene in the Community*, in an unpublished paper entitled "Mental Hygiene Possibilities in a County Health Department," stresses the importance of a thorough community survey prior to the establishment of clinical service, and gives a very fine outline to be followed in such a study. A sufficient number of surveys in different types of communities have probably been done now

TABLE 2

*Outline of a County Mental Health Program,  
Williamson County, Tenn.*

1. A psychiatric and mental hygiene clinic, serving the county.
2. A special program of training in psychiatry and mental hygiene for the regular public health personnel of the county, including:
  - a. A short didactic course in the fundamentals of psychiatry
  - b. Demonstration of patients at weekly staff conferences on clinic cases
  - c. Routine individual and group conferences of public health nurses with a case work supervisor
  - d. Joint visiting in the field by public health and psychiatric personnel
3. Psychiatric education of other professional groups:
  - a. Practising physicians of the community
  - b. School teachers of the county
4. Community education through:
  - a. Talks to Parent Teacher Associations and similar groups
  - b. Newspaper articles
  - c. Distribution of literature
  - d. Radio talks
  - e. Films

(Eastern Health District,<sup>1, 6, 7</sup> Williamson County, Tenn.,<sup>8, 9</sup> Kentucky,<sup>10</sup> Chicago<sup>11</sup>) to make an elaborate survey unnecessary prior to starting every new county mental hygiene program. Both Miss Bassett and Dr. Roth from the Tennessee study point out, however, that surveys do more than prove the existence of a large number of cases which need help; this can now be taken for granted. They also serve to familiarize the mental hygienist with the various community leaders and agencies which will both contribute cases to the mental hygiene program and act as social and economic resources which are so important in the successful operation of the mental hygiene service.

An increasing proportion of referrals to the clinic will come from the other health department personnel after they become familiar with the help available and sensitized to recognizing cases that need such help. The public health

nurses and physicians have intimate contact with a group of people who have more than their share of the disturbing situations and emotional crises which make mental hygiene problems. The nurse who actually gets into the home frequently sees family situations which need help and, indeed, she often gives valuable help to the best of her ability, although she would likely call it common sense sympathy and understanding rather than mental hygiene.

The admirable book *The Public Health Nurse and Her Patient*, by Ruth Gilbert,<sup>12</sup> should be read by every health officer and nurse, and will be particularly valuable if supplemented by appropriate educational efforts of the mental hygiene psychiatrist attached to the health department. The public health physician who sees the newly identified cases of syphilis and tuberculosis frequently is aware of important mental health problems which should be referred to the mental hygiene clinic. Attendance at prenatal clinics by the psychiatrist gives an opportunity for important preventive work with expectant mothers whose emotional needs are often ignored.

A psychiatrist who attends the well child clinics has an opportunity to do real preventive psychiatry in the truest sense of the term, seeing cases of faulty habit behavior and emotional patterns before they have been recognized as problems. Such clinics are held with encouraging results in the Eastern Health District of Baltimore.<sup>13</sup> It has been suggested that these clinics be held in the domestic science classroom of the high schools with the assistance and under the observation of girls who will be tomorrow's mothers.

Much more could be added concerning the clinic phase of the mental hygiene program but it suffices to say that case work should be the backbone of the program. In a community containing so many persons urgently in need

of help, a purely educational program falls flat.

I am reminded of the challenge of the child's charade game,

"Here we come."

"Where from?"

"What's your trade?"

"Show us some."

Mental hygiene psychiatrists must also "show us some." Teaching and preaching without performance are not likely to acquire the interest and support required for the success of the program.

Clara Bassett stresses the importance of directing the first educational work toward public health personnel which is also mentioned first in the educational aims of the Williamson County program, where it starts with a course of six didactic evening sessions supplemented by recommended reading. Dr. Roth reports that this is well accepted and is considered to be a stimulating experience by those taking the course. These lectures are followed by group conferences every 2 weeks at which cases are presented. Some psychiatric training for health department personnel is particularly helpful in the increasing number of states in which health officers are given legal responsibility in the commitment and sterilization of the mentally ill.

Weekly individual conferences are held with the nurses in which a professional member of the mental hygiene unit discusses, from a mental hygiene aspect, individual cases in the nurse's load. Suggestions are given as to management and the progress of cases is followed from week to week. Frequently the consultant actually visits the homes with the nurses.

Case consultations have already been mentioned as the most important means of educating practising physicians, most of whom will have graduated from schools with inadequate psychiatric instruction. Talks and papers to medical



groups however are also, of course, in order. These remarks apply also to educational work with the school teachers. In Alabama several state health department mental hygiene clinics are actually being held in teachers' colleges.

Talks to Parent Teacher Associations and other lay groups must be made whether or not one is convinced of their value. Care should be taken however not to expend a disproportionately large amount of time in this activity; time spent in seeing and helping troubled individuals from the community will do more toward creating confidence and good will for the program. The laity should be encouraged to form mental hygiene groups to affiliate with the state and national mental hygiene society through which literature and speakers for programs may be obtained. The National Committee for Mental Hygiene is also a source of literature which may be distributed free, or at a slight cost, and also material for newspaper articles. One state health department is putting not only pamphlet literature but a limited number of mental hygiene books in the public libraries, particularly in the rural traveling libraries.

The collection of epidemiological data in connection with mental disorders is being increasingly recognized as valuable; for this reason close collaboration should exist among the departments of mental hygiene, epidemiology, and statistics. Interesting and perhaps important correlations have been found whenever social, economic, and mental disorder interrelationships have been studied.<sup>1, 6, 7, 8, 9, 10</sup> There is a great need for a central register of nervous and mental disorders. This should properly be established in the state health department, but it depends on material gathered and submitted by the counties.

In closing, I wish to mention the fine address given by Sir Wilson Jameson, Chief Medical Officer of the British Ministry of Health at the American

Public Health Association Meeting in Atlantic City.<sup>14</sup> In this address, which for the most part took the form of a report on public health conditions in England, Sir Wilson devoted a generous proportion of his time to nervous and mental disorders. It is apparent that even in England, a country at war and beset by so many emergency public health problems, mental hygiene is considered an important phase of the public health. It is important as a trend in public health thinking in our country that the Southern Branch of the American Public Health Association has placed this subject on its annual program.

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# Experience with the Test for Vi Agglutinative Properties for *Eberthella typhosa*

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THE study of Vi agglutination<sup>1</sup> with *Eberthella typhosa* was undertaken with the twofold objective of securing experience with the technical procedures and determining the practicability of performing the test as a routine procedure in a diagnostic laboratory. Vi agglutination has been found of limited value in the diagnosis of typhoid fever, since it does not occur consistently at any one stage of the illness.<sup>2-9</sup> On the other hand, it has been demonstrated in sera from a high percentage of typhoid carriers.<sup>10-14</sup> Most of these reports are based on reactions with a pure Vi strain of *E. typhosa*, designated by Bhatnagar<sup>12</sup> as "Vi 1," or with a strain rich in Vi antigen after absorption of the serum with a strain devoid of Vi antigen. No mention was found in the literature of a zone of inhibition (pre-zone, prozone, or proagglutinoid zone) in the tests, a phenomenon that was at once apparent when our work was undertaken. Centrifugation proved effective in demonstrating reactions in high concentrations of sera, not only of those shown to have zones of inhibition, but in many in which no agglutination was observed prior to this treatment. Later, it was found that Shibley (1929)<sup>15</sup> had made a similar observation in his study of artificially produced zones of inhibition.

## TECHNIC

A pure Vi strain of *E. typhosa*, designated by Bhatnagar as "Vi 1," and the "Watson" strain, known to be rich in Vi antigen, were obtained from Dr. Kauffmann, State Serum Institute, Copenhagen, Denmark. They were maintained on inspissated egg medium,<sup>16, 17</sup> in sealed tubes and stored in a refrigerator.

### INSPISSATED EGG MEDIUM<sup>17</sup>

Sodium chloride solution, 0.5 per cent. . . 1 part  
Eggs (white and yolk) . . . . . 3 parts

Transfer the egg contents aseptically to a weighed sterile flask containing glass beads. Determine the increase in weight and add the required amount of sterile salt solution. Mix by shaking thoroughly. Dispense aseptically 3 ml. in 125 x 13 mm. tubes. Slant and inspissate at 80° C. for 1 hour on two successive days.

Transplants were made at 6 month intervals. Subcultures on beef infusion agar were incubated from 18 to 20 hours at from 35° to 37° C. and suspended in 0.85 per cent salt solution. Living suspension was prepared each day that tests were performed. Suspension killed by the addition of 0.2 per cent formalin (40 per cent formaldehyde) was stored in a refrigerator and used for no longer than 4 weeks after preparation. The turbidity of suspensions was adjusted to that of barium sulfate standard No. 3.<sup>18</sup> Equal volumes (0.3 ml.) of suspen-

sion and 5-, 10-, 20-, and 40-fold dilutions of sera were combined in 11 x 75 mm. tubes, incubated for 2 hours at from 35° to 37° C., and left in a refrigerator overnight. The reactions were recorded before and after centrifugation for 10 minutes at approximately 2,000 r.p.m.

The degree of agglutination was recorded as follows:

A. Before centrifugation—

- 4+ supernatant clear; complete agglutination
- 3+ supernatant clear or nearly clear; definite clumping
- 2+ supernatant slightly turbid; definite clumping
- + supernatant turbid; small clumps definitely visible to unaided eye
- uniformly turbid suspension; no clumps

B. After centrifugation—all reactions read after shaking.

Comparison with the suspension combined with salt solution for purposes of control is very important.

- 4+ complete agglutination in clear fluid
- 3+ definite agglutination in clear or nearly clear fluid
- 2+ definite agglutination in slightly turbid fluid
- + clumps definitely visible to the unaided eye in turbid fluid
- no clumps; uniformly turbid suspension

Serum for purposes of control was produced in rabbits with *E. typhosa* Vi 1. The titer was relatively low.

After absorption with *E. typhosa* "Felix H 901," a strain devoid of Vi antigen, no agglutination was obtained with the latter in a 10-fold or greater dilution, while the Vi 1 strain was agglutinated in an 80- or 160-fold dilution. A high titered agglutinating serum that contained no Vi agglutinative properties was also used for purposes of control.

Absorption of agglutinative properties other than Vi was undertaken with a small number of sera. A heavy suspension of the growth of *E. typhosa* Felix H 901 from beef infusion agar was made in a 5-fold dilution of serum. This was incubated 2 hours at from 35° to 37° C. and left at room temperature overnight. It was then centrifuged until the supernatant was clear—usually for 30 minutes at approximately 2,000 r.p.m. The supernatant, undiluted and in 2-, 4-, and 8-fold dilutions, was tested for agglutination with *E. typhosa* Felix H 901 and Vi 1, and usually with the Watson strain.

#### DISCUSSION

The results summarized in Table 1 were obtained after centrifugation of tests with living suspension of *E. typhosa* Vi 1. All sera were tested at least twice, except a few that reacted in high dilutions in the first examination. The relatively large number of

TABLE 1

Reactions in Sera Following Centrifugation of Tests with Living Suspension of *E. typhosa* Vi 1

Source of Specimen	Number Tested	Definite Agglutination		No Agglutination		Irregular or Indefinite Agglutination	
		No.	Per cent	No.	Per cent	No.	Per cent
Typhoid carriers	82	62	75.6	8	9.7	12	14.6
Patients having typhoid fever	37	14	37.8	12	32.4	11	29.7
Patients having infections with members of the paratyphoid-enteritidis ( <i>Salmonella</i> ) group	12	1	8.3	8	66.6	3	25.0
Individuals who had received typhoid vaccine	46	7	15.2	34	73.9	5	10.8
Random specimens*	157	8	5.1	130	82.8	19	12.1

\* From the information available, these specimens could not be placed in any of the other four groups.

indefinite or irregular reactions should not be misinterpreted. They usually represent no agglutination in one test and definite but incomplete agglutination (2+) in a 10-fold dilution of the serum in another test, which is no greater variation than may be expected in repeated examinations of this type. Agglutination was apparent only after centrifugation of the tests with half of the 92 sera that gave reactions.

them, as well as in the artificially produced Vi agglutinating serum. Thus, it seems important that tests for Vi agglutination be performed at least twice, preferably with not less than 3 or 4 days intervening. The results with two sera, one from a patient having typhoid fever and the other from a carrier, have been summarized in Table 2 to illustrate this point.

Since some species of *Salmonella*

TABLE 2  
*Vi Agglutination in Two Sera Tested at Intervals*

Serum	Date Received	Date Tested	Agglutination											
			Before Centrifugation						After Centrifugation					
			1:10	1:20	1:40	1:80	1:160	1:320	1:10	1:20	1:40	1:80	1:160	1:320
No. 2213 from typhoid carrier	8- 5-41	8- 6-41	+	+	—	—	..	..	+	+	+	—	..	..
		8- 7-41	2+	3+	+	—	..	..	3+	3+	3+	+	..	..
		8-13 41	2+	2+	—	—	..	..	3+	3+	2+	—	..	..
No. 1370 from a patient hav- ing typhoid fever	5-20 41	5-20-41	—	—	—	—	+	+	4+	4+	4+	4+	3+	3+
		5-23-41	4+	3+	3+	3+	+	—	4+	4+	4+	4+	3+	—

4+ = complete agglutination

3+, 2+, and + = degree of agglutination as compared with 4+

— = no agglutination

Approximately one-third of the sera were tested with formalin-treated as well as with living suspension of *E. typhosa* Vi 1. The former was agglutinated somewhat more frequently before centrifugation, but the titer after centrifugation was often higher with living suspension.

Not infrequently, sera that reacted only after centrifugation when first tested, gave agglutination before as well as after this treatment in tests performed one or more days later. Occasionally, little or no agglutination occurred before or after centrifugation of tests with fresh sera, and definite reactions occurred in later tests. These irregularities cannot be explained by variation in the agglutinability of the living culture, since usually several sera were tested at the same time and agglutination was obtained in some of

possess Vi antigen, it is not surprising that serum from one patient having an infection with a member of group D *Salmonella* gave definite Vi agglutination with *E. typhosa* in an 80-fold dilution. Blood from three other individuals having infections with the same species failed to show any Vi agglutinative properties, while that from a fifth reacted irregularly.

The relatively large number (15 per cent) of reactions in sera from individuals who had received typhoid vaccine may be more apparent than real, because many such specimens that failed to agglutinate were tested only once, and therefore are not included. One of the seven individuals who had received typhoid vaccine and whose sera contained Vi agglutinative properties was a nurse who was caring for her brother, who had typhoid fever.

No *E. typhosa* was found in several fecal specimens from her; no specimens were submitted from the others.

Sufficient information is not available concerning the specimens selected at random to draw definite conclusions as to the significance of the Vi agglutinative properties in eight, or 5 per cent, of the number examined. All except one contained granular or floccular agglutinative properties or both. One fecal specimen only was received from each of two of these individuals, and none from the others. One was said to have had her gall bladder drained, but so far as could be determined, a bacteriologic examination of the bile or of feces had not been undertaken.

The presence of Vi agglutination was not correlated with floccular and granular agglutination. Of the eighty-two sera from carriers, eighty gave floccular agglutination in at least a 40-fold dilution and two, in only a 20-fold dilution. Vi agglutination occurred in one of the latter. Of the other seven in which no Vi agglutinative properties were demonstrated, one gave floccular agglutination in a 640-fold dilution, five in a 160-fold dilution, and one in an 80-fold dilution. Several sera from patients having typhoid fever contained no Vi agglutinative properties, but gave both granular and floccular agglutination with *E. typhosa* in relatively high dilutions.

Forty-five sera absorbed with *E. typhosa* Felix H 901 were tested for agglutination with *E. typhosa* Vi 1, and most of them with the Watson strain as well. Centrifugation was often necessary to demonstrate agglutination after, as well as before, absorption. There was no appreciable difference in titer with *E. typhosa* Vi 1 in unabsorbed and absorbed portions of sera. The titer with *E. typhosa* Watson in absorbed sera was usually the same as, but in a few instances lower than that with Vi 1. This procedure was not studied further,

because it seemed to offer no advantage over the simpler agglutination test.

#### SUMMARY

The observations reported are based on the demonstration of agglutination with the strain of *E. typhosa* designated as Vi 1 by Bhatnagar. Vi agglutination was often demonstrated only after centrifugation, especially in tests with fresh sera. If these sera were retested after a few days, agglutination was sometimes observed before the tests were centrifuged. These facts may be of significance in other agglutination tests, especially in sera with zones of inhibition.

In a study of over 300 sera, definite Vi agglutination was obtained in 75 per cent from known typhoid carriers; 37 per cent from patients having typhoid fever; 15 per cent from individuals to whom typhoid vaccine had been administered; and 5 per cent of sera selected at random. Insufficient data are available to establish the significance of the reactions in the "random" specimens, and in those from persons who had received typhoid vaccine.

The demonstration of Vi agglutination with *E. typhosa* suggests infection with this microorganism and warrants thorough investigation. Absence of Vi agglutination does not exclude such a condition. The performance of this test as a routine diagnostic procedure seems practicable in any laboratory where facilities are available for adequately controlling the reactions of the agglutinating suspension and the sera.

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## Important News

In response to numerous inquiries, the Program Committee announces that plans are proceeding to hold the 71st Annual Meeting of the Association in St. Louis, October 27-30 as planned.

Public health is sufficiently identified with the war effort to make it imperative that the profession should hold its regular session, to which will come many members of the armed forces of the United Nations and many leaders in war industry to share the latest information available both here and abroad for our common purpose. There will be representation from England, where recent experience shows that it is essential that public health groups meet—not in spite of the emergency, but because of it, and because they are so integral a part of defense.

As Dr. Parran has so well said, "Ours is the responsibility for leading the fight against the weakness from within which impedes attack upon the enemy without."

# The U. S. Public Health Service Restaurant Sanitation Program\*

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ACCORDING to the Public Health Service compilation of disease outbreaks conveyed through various vehicles in 1939, the number of outbreaks reported by state and city health departments from foods other than milk was greater than for all other vehicles combined. Water supplies were responsible for 43 outbreaks, milk and milk products for 41, other foods for 148, and unidentified vehicles for 17. Of the 148 food-borne outbreaks, 88 involved food poisoning, 37 gastroenteritis and dysentery, 9 botulism, 5 typhoid fever, 4 trichinosis, 2 paratyphoid fever, 1 scarlet fever, and for the remaining 2 the disease was not given.

Of the 47 food-borne outbreaks for which the type of establishment was reported, all but 4 were traced to establishments regularly serving public or semi-public meals, including restaurants, clubs, hotels, camps, schools, and public institutions. The number of public eating and drinking establishments responsible for outbreaks cannot be definitely determined from these reports, but there is every indication that it is significant, and that greater attention to restaurant sanitation is warranted.

While it is impossible to estimate the amount of disease actually spread through public eating and drinking establishments, there is no doubt that food and utensils may be infected by

organisms from the saliva and other body discharges. The organisms may be transmitted by direct or indirect contact from a case or carrier among the customers or the employees. They may be coughed or sneezed on food, dishes, or utensils. They may be left on glasses, cups, spoons, and forks by mouthing. They may reach the dishwater from washers or indirectly from customers. Or cleaned dishes may be exposed to contamination by handling or droplet infection.

## DEVELOPMENT OF RECOMMENDED ORDINANCE AND CODE

The Public Health Service first became actively interested in the sanitation of eating and drinking establishments in 1934. In that year minimum restaurant sanitation regulations were proposed for approval by the National Recovery Administrator in connection with Section IV, Article VIII, of the *Code of Fair Competition for the Restaurant Industry*.

Next, at the request of some health officers for a suggested form of ordinance for local use, the Public Health Service prepared the December, 1935, draft of *An Ordinance Regulating Food and Drink Establishments*. This draft was mimeographed but was not circulated except on request.

As a result of successful experience with the *Standard Milk Ordinance*, an increasing demand arose on the part of health officers for an ordinance and interpretative code on restaurant sanitation.

\* Read at a Joint Session of Engineering and Food and Nutrition Sections of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 15, 1941.

tion. Accordingly, after a detailed study of 18 existing municipal ordinances and state regulations, a tentative *Ordinance and Code Regulating Eating and Drinking Establishments* was issued in mimeographed form in March, 1938. In spite of its tentative nature there were many requests for copies, and it was adopted as a local ordinance or as state regulations in many areas.

It was not until 1940 that the Public Health Service Sanitation Advisory Board had an opportunity to review the tentative edition and consider proposed amendments. Following this meeting the first non-tentative edition of the recommended *Ordinance and Code Regulating Eating and Drinking Establishments* was issued in mimeographed form in June, 1940.

The latest edition is, therefore, the culmination of six years' effort represented by four different drafts. It embodies the best information at present available on restaurant sanitation but, like the other codes recommended by the Public Health Service, it should be considered subject to change as improvements are developed through research and experience. It is recommended for voluntary adoption by states, counties, health districts, and municipalities in order to encourage a greater uniformity and a higher level of excellence in the sanitary control of eating and drinking establishments. This edition has been incorporated in both the 1940 and the 1941 editions of the *Sanitation Code* suggested by the Public Health Service for state or local adoption in national defense areas.

Inspection forms were prepared to accompany both the 1938 and the 1940 editions. The printed 1940 inspection form is available for quantity purchases by health officers from the Superintendent of Documents. It is planned to print office ledger record forms for posting inspection and laboratory results, and sanitation rating forms for use by

the states in measuring the effectiveness of local control programs.

#### PHYSICAL EXAMINATION OF EMPLOYEES

Naturally, many diverse viewpoints had to be coordinated in drafting an ordinance that would be generally applicable. Among the questions at issue was whether to require physical examination of food handlers in restaurants. Such a requirement was included in the 1935 draft but has been deleted from both the 1938 and the 1940 editions. During its consideration of these *Codes* the Public Health Service Sanitation Advisory Board debated the advisability of including a provision for health examinations, but concluded that the conflicting opinions of health officers on the value of routine medical examinations for food handlers did not warrant such a requirement. For example, the experience of New York City as reported by Dr. Best in 1937<sup>1</sup> indicated that examinations made by private physicians were not considered reliable, and that the cost of adequate examinations by the health department was not commensurate with the public health benefits obtained. New York City has therefore discontinued annual examinations of food handlers.

Admitting that periodic examinations are unwarranted, it may be asked whether examinations made only before or at the time of employment are worth while in the case of food handlers. This is the procedure suggested in the current milk ordinance recommended by the Public Health Service, but even in that case examinations of milk handlers on farms producing milk for pasteurization is not recommended because of the large numbers involved. Employees of eating and drinking places are even more numerous, and the turnover is greater. The Advisory Board therefore concluded that even initial health examinations should not be required in a restaurant ordinance that is recommended for gen-



eral adoption. However, health officers who inquire are informed that they may include such a requirement at the time of adoption if they prefer to do so and if their official facilities for making examinations are adequate for the task.

Lest it be inferred that the recommended ordinance makes no provision for the control of communicable disease, attention is called to section 10, which makes the manager and the employee jointly responsible for the prompt reporting to the health officer of all cases of communicable disease, and to section 11, which authorizes the health officer to make adequate medical examinations of employees when infection is suspected, and to exclude infected employees from all eating and drinking establishments.

#### THE PROVISIONS OF THE ORDINANCE

The restaurant ordinance and code follows the same general form as the *Standard Milk Ordinance* which has had such wide acceptance. Part I is the short enabling form of the ordinance suggested for use wherever adoption by reference is considered legal. The short form greatly reduces the cost of publication, and is more readily kept up-to-date because it is so easily amended. Two short forms are presented, one a grading type, which permits enforcement by degrading or permit revocation or both, the other a non-grading type enforceable by permit revocation only. Part II is the unabridged ordinance recommended for adoption only where the short enabling form is not legal. All words referring to grading are enclosed in parentheses, so that the grading form of the unabridged ordinance is obtained by omitting the parenthesis signs only, while the non-grading form is obtained by deleting both the parentheses and the words included therein. Part III is the interpretative code, which gives the public health reason for each requirement of the ordinance and explains

in detail what constitutes satisfactory compliance.

A brief outline of the provisions of the recommended restaurant ordinance may be of value in this discussion.

Sections 1 and 2 deal with definitions and permits.

Section 3 requires the public display of a grade notice in all restaurants where the grading form of the ordinance is in effect. The grade display is the means whereby the competitive effect of grading tends to improve restaurant sanitation. Section 4 authorizes the examination and condemnation of unwholesome or adulterated food or drink.

Section 5 requires the inspection of all restaurants at least once every 6 months. A restaurant found violating any item of sanitation must be notified in writing and must be given a reasonable time to correct the defect. If the same violation is again found on the next inspection the restaurant is subject to degrading or suspension of permit.

Section 6, the longest and most important of the sections, lists the sanitation standards for grade A restaurants, which are identical with the minimum requirements where the non-grading form is adopted. These cover construction and cleanliness of floors, walls and ceilings, doors and windows, lighting and ventilation, toilet, water supply, hand-washing facilities, disposal of wastes, the construction, cleaning, bactericidal treatment, storage, and handling of containers and equipment, refrigeration of readily perishable foods, wholesomeness of food and drink, including milk, milk products, and shellfish from approved sources, storage and display of food and drink to avoid contamination, cleanliness of employees, and miscellaneous requirements. These items of sanitation are conveniently summarized in the inspection form prepared for use with this ordinance.

In the grading form of the *Ordinance*, the remainder of section 6 is concerned

with specifications for grade B, grade C, and itinerant restaurants. Grade B restaurants are those which fail to meet certain grade A requirements that are not of major public health significance. In communities which are not yet in position to limit operations to restaurants of the highest grade only, the grade B definition serves as the specifications for the second grade. In municipalities which under section 7 permit none but grade A restaurants to operate, except during temporary degrading periods, grade B serves a useful rôle as a penalty grade to which grade A restaurants may be temporarily degraded for minor violations which the health officer would hesitate to punish with so severe a penalty as suspension of permit.

Grade C restaurants are those which violate any of the requirements for grade B restaurants.

Itinerant restaurants (*i.e.*, those operating for temporary periods in connection with a fair, carnival, circus, public exhibition, or similar gathering) are required to comply with certain reasonable minimum requirements which are listed.

Section 7 provides that after 12 months following adoption, no restaurant may continue in business unless it complies with the minimum requirements, or (in case the grading form is in effect) unless it qualifies for grade A or grade B. Communities in position to do so may restrict operations to grade A restaurants only, except during temporary degrading periods not exceeding 30 days.

Section 8 outlines the procedure for reissuing of the permit or for regrading upward any restaurant whose permit has been suspended or which has been degraded.

Section 9 prohibits the use of any polish containing cyanide preparations for the cleansing or polishing of utensils.

Section 10 requires the restaurant manager to notify the health officer of

any communicable disease among his employees, and section 11 confers on the health officer broad powers of control when infection is suspected.

Section 12 specifies that enforcement shall be in accordance with interpretations contained in the *Code*. In section 13, on penalties, the exact wording is left to the community. The last two sections deal with the usual provisions regarding repeal, date of effect, and unconstitutionality.

#### EXTENT OF ADOPTION

The Public Health Service urges states not already doing so to launch a restaurant sanitation program along the same lines as the milk control program. A satisfactory state program would include the appointment of a restaurant sanitarian where necessary, promotion of the local adoption of the ordinance by municipalities, counties, and health districts, the training of local inspectors, provision for consultant service to local health departments on technical problems, and the measurement of the effectiveness of local control programs by means of sanitation ratings. The promulgation of this ordinance as state regulations may serve to encourage its local adoption by cities and counties within the state. Most states will prefer to delegate the enforcement of such state regulations to local health units where these are functioning.

In response to inquiries from many health officers, the Public Health Service recently circularized all state health departments to determine the extent of adoption of the recommended restaurant sanitation ordinance. Incomplete returns indicate that the ordinance or state regulations based thereon are legally in effect in communities located in 24 states and 1 territory.

In 6 of the states the State Board of Health regulations, based on or similar to the restaurant ordinance recommended by the Public Health Service,

are enforced state-wide; in 3 of these (Nevada, Oklahoma, South Carolina) by the state health department, and in 3 (Kentucky, Mississippi, North Carolina) by both state and local health agencies. In 5 other states (Arkansas, Florida, Georgia, Indiana, Missouri) which have adopted such regulations, enforcement is not state-wide but is left to local health officials. Six of the state regulations are based on the 1938 edition, 5 on the 1940 edition.

This ordinance, or similar ordinances or regulations based thereon, has in addition been legally adopted by 74 counties and by 123 municipalities, located in 19 states. Of these, 38 located in 4 states (Arkansas, Florida, Kentucky, Ohio) adopted the state board of health regulations, 74 located in 3 states (Alaska, Illinois, Virginia) adopted the state health department's model ordinance based on that of the Public Health Service, and 85 located in 15 states adopted the Public Health Service ordinance. Approximately two-thirds of the ordinances adopted locally correspond to the 1938 edition, the remainder to the 1940 edition.

A voluntary local program of restau-

rant sanitation with the Public Health Service ordinance used as a guide but without legal adoption is reported under way in communities in 4 states.

That additional adoptions are being considered is indicated by the reports from a number of states. Eight states are planning to adopt state board of health regulations based on the recommended restaurant ordinance, and 53 counties and municipalities located in 15 states are considering its adoption as a local ordinance.

It is evident, therefore, that the restaurant sanitation ordinance recommended by the Public Health Service is proving very popular with health officers. It is suitable for adoption by states, counties, and municipalities both large and small, and by areas which advocate grading as well as those which prefer minimum requirements. It is particularly useful at this time in connection with the sanitation of national defense areas, in many of which the ordinance is already in effect.

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# Engineering Health Services for Small Plants\*

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AS the dividing line between small and large industrial plants has been variously defined as 500 employees, 100 employees, and sometimes even less, it will be necessary for the purpose of this discussion to redefine this dividing line. For the purpose of this paper I shall define a small plant as one with less than 100 employees, and a large plant as one with 100 or more employees.

Using this arbitrary definition and census statistics,<sup>1</sup> it becomes immediately evident that the small plant outnumbered the large one to a great degree. Approximately 90 per cent of all of the manufacturing and mechanical industrial establishments employ less than 100 persons. About half of all of such establishments employ less than 10 persons. Thus, the small plant is the rule, not the exception. Of course, when number of employees is the only consideration, then the small plants lose some of their importance, since they employ only about 30 per cent of all workers. But from any consideration, the problem of supplying health services to small plants is a very important one.

Since fewer persons work in an individual small plant than in the large one, it can be expected that injuries and

diseases will be fewer in the smaller plant. However when the incidence of injuries is calculated on a man-hour basis, a different result occurs. Statistical studies of accidents and disease, from which an analysis of frequency and severity of such disabilities in small plants can be made, are very difficult to find. Most of the reporting of this nature comes from large plants, where accurate records of accidents and diseases are more likely to be maintained.

The largest plants reporting to the National Safety Council<sup>2</sup> during 1939 had a disabling injury frequency rate of 11.08 (disabling injuries per million man-hours worked), while the smallest plants had a rate of 17.47, or 58 per cent higher. The severity rate for disabling injuries in the smallest plants averaged 1.66 (disability days per 1,000 man-hours worked), or 21 per cent more than the large plant rate of 1.37.

There is reason to believe that a similar situation exists for incidence and severity of disease. If we believe that safety and health services are effective and thus act to reduce the incidence and severity of injuries and disease, then we are forced to the conclusion that these rates will be higher in small plants because it is comparatively easy to show that small plants now are not receiving an adequate amount of such services.

Small plants are handicapped by hav-

\* Read at a Joint Session of the Industrial Hygiene and Public Health Nursing Sections of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 15, 1941.

ing a relatively small amount of money to spend, and it has been shown by Newquist<sup>3</sup> that the smaller the plant, the more costly are health services to employer and employee. Small plants find it more difficult to justify the expenditure of sufficient money for adequate preventive measures and equipment; they find it more difficult to pay for the technical advice necessary for proper industrial health control.

A comparison of industrial health provisions for small and large plants is shown<sup>4</sup> in Chart 1 in which it will be seen that the contrast is very marked. In every instance the small plant is far behind the large plant in the health provisions shown, with the

exception of first aid kits and accident records, and even in these two services the small plant lags.

A similar situation is shown graphically in Chart 2.

This chart shows the situation in St. Louis with respect to the health services to be discussed. St. Louis has been termed a "typical industrial area" by the U. S. Public Health Service. It is interesting to note the continuous prevalence of safety director or engineering service over either nursing or medical service. It is also interesting to note that the curve for physicians rises above that for nurses in the smaller plants, but these conditions are reversed in the larger plants.

The contrast in these provisions as to

INDUSTRIAL HEALTH SERVICE PROVISIONS IN PLANTS EMPLOYING MORE THAN 100 WORKERS AS COMPARED WITH PLANTS EMPLOYING 100 WORKERS OR LESS

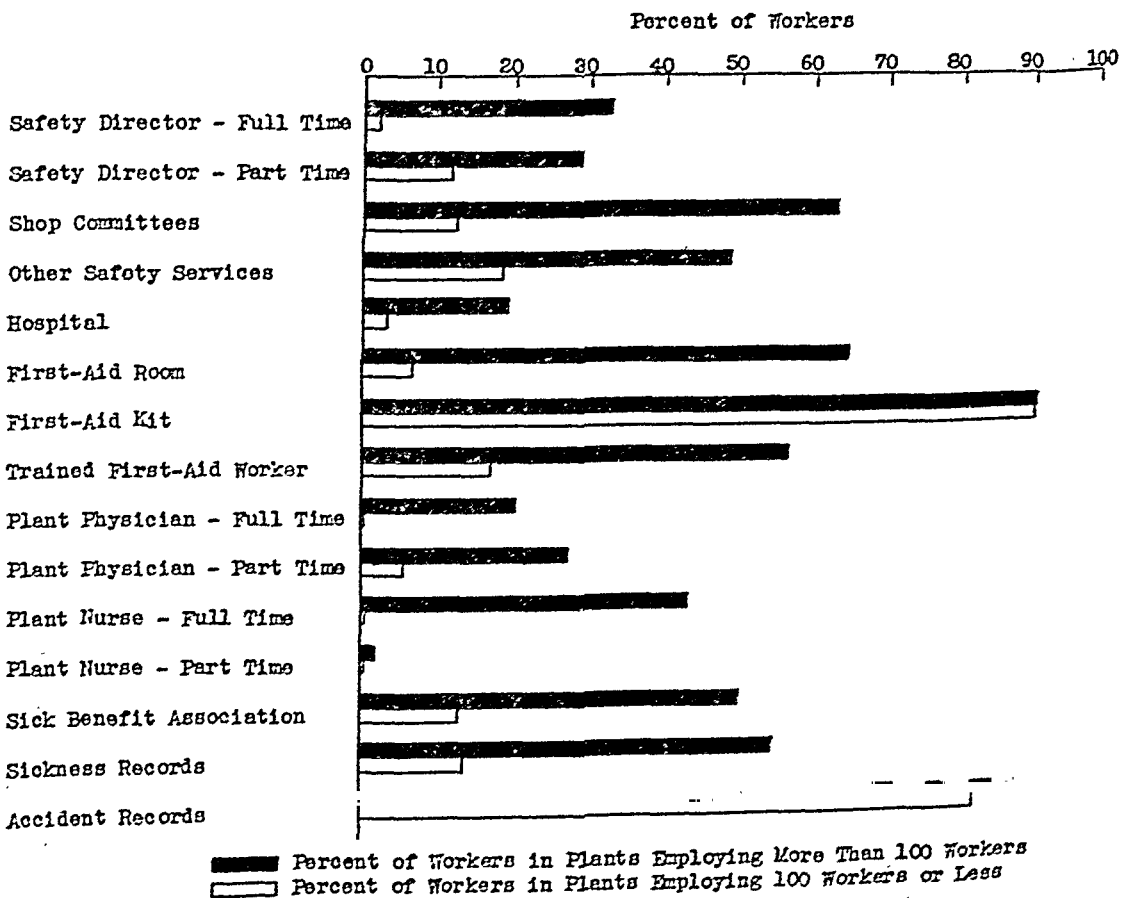


CHART 1

large and small plants is again shown in Table 1.

TABLE 1

*Extent of Industrial Part-Time and Full-Time Services of the Physician, Nurse, and Safety Director or Engineer*  
(From Survey Records of the St. Louis Health Division)

Service	Per cent of All Small Plants	Per cent of All Large Plants
Safety director or engineer	2.4	44.4
Nurse	0.8	28.6
Physician	1.3	23.8
None of above services	96.5	49.2

The typical health and safety set-up in the small plant is composed of the following: a physician on call, who never sees the plant or its operations except on his emergency calls; no nursing service; perhaps a man assigned to

first aid, in a few instances with first aid training and who makes use of a small and indifferently-kept first aid kit; and an official—superintendent or owner—who devotes a minor part of his time to safety control work. No sickness records are kept in this typical small plant and only those accident records which are necessary under the Workmen's Compensation Law are available. This is the situation and it is the one that we should consider if health services are to be furnished to and accepted by the small plant.

We in public health work have discussed at some length and through a number of publications the need of helping the small plant with its health problem. But we have found it extremely difficult to apply our ideas.

According to census statistics, retab-

EXTENT OF INDUSTRIAL PART-TIME AND FULL-TIME SERVICES OF THE  
PHYSICIAN, NURSE, AND SAFETY DIRECTOR OR ENGINEER  
(From survey records of the St. Louis Health Division)

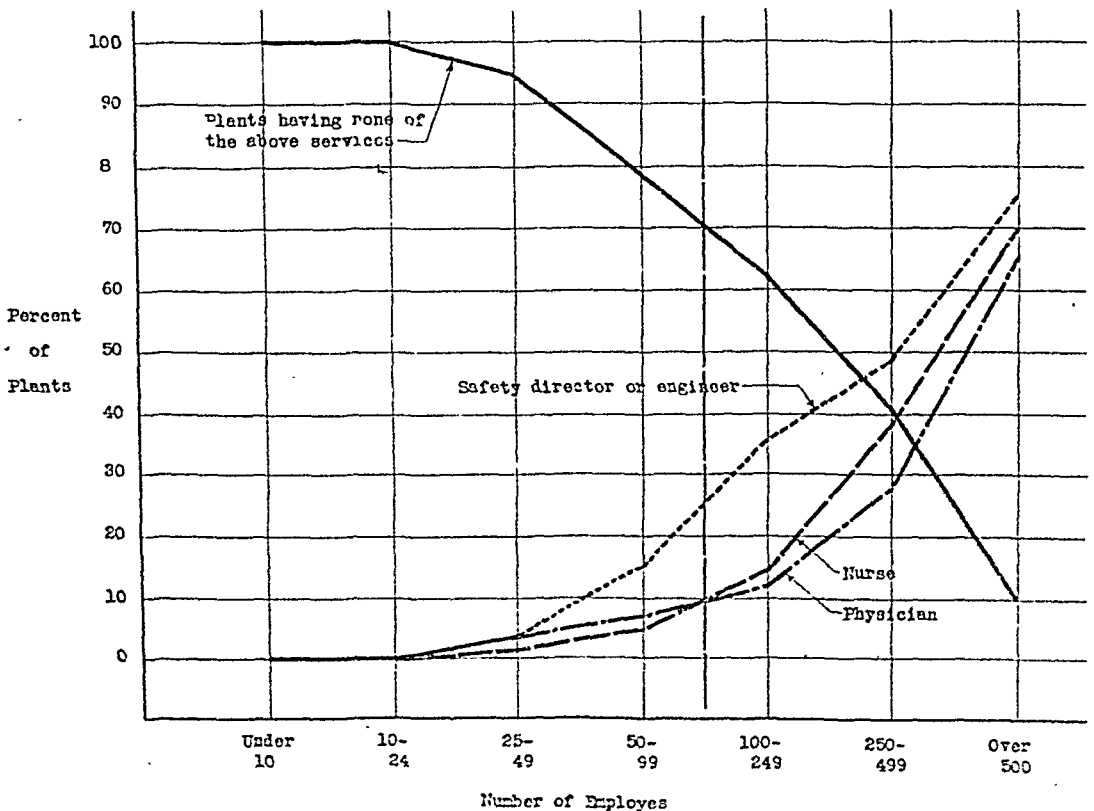


CHART 2

ulated by the U. S. Public Health Service in *Bulletin 259*, there are some 203,000 plants in the manufacturing industries of the United States and about 8,800,000 wage earners are employed in these plants. This results in an average of 43 wage earners per plant.

Table 2 shows the average number of workers involved in studies made by various official bureaus of industrial hygiene in the United States in the 1939-1940 fiscal year.<sup>5</sup>

TABLE 2

*Average Number of Workers Involved in Industrial Hygiene Field Studies Made by Reporting State and Local Health Departments, 1939-1940*

State Reporting	Average Number of Workers Involved
Utah .....	3,493
Texas .....	849
Idaho .....	473
West Virginia.....	439
Pennsylvania .....	238
California .....	176
Virginia .....	171
Ohio .....	169
North Carolina.....	123
Iowa .....	123
Wisconsin .....	118
Colorado .....	96
Indiana .....	77
Alabama .....	77
Missouri (St. Louis).....	55
South Carolina.....	55
New Hampshire.....	47
Connecticut .....	41
Vermont .....	39
Rhode Island.....	25
Maryland (Baltimore).....	4

It is perhaps somewhat unfair to cite these statistics because some of these agencies are just being organized, and also because there are valid reasons for the type of work being done by these agencies.

It is indicated that even the official agencies are finding it extremely difficult to provide adequate health services to the small plant in the proportion that they exist in our industrial set-up.

It can be safely concluded that health services now are not being satisfactorily supplied to small plants. If the small plant is to be reached by such health

services, it must be done by coöperative plans of service, by public or private subsidy, or by inventing preventive methods which are less costly, thus bringing them within the price range that can be afforded by the small plant.

So much for the basic situation. Others will discuss the provision of medical and nursing services. My part of this symposium is the engineering health services for small plants.

The public health engineer should find his task less difficult than that of the nurse or physician, for he starts with two advantages:

1. The engineer is already in action in industry. The physician may find few, if any, in the plant management who will comprehend him professionally or who can aid him professionally. Similarly, the nurse has only the trained first-aidier. But the public health engineer may find a fellow engineer at the drafting or designing table in even the small industrial establishment; the owner or manager frequently is an engineer or has been forced to learn technical terms and methods in this mechanical age. We engineers find many in industry who speak our language.

2. Safety work in industry is far advanced. Even small industry is safety-minded. One is tempted to doubt the truth of this statement when he finds glaring violations of the simplest safety principles. But much safety work has penetrated down to small industry. A great portion of this work has been mechanical and has been applied by technical men. These men are in the small plant and may serve as a nucleus around which may be built engineering health work.

It has been said that environmental control is the special province of the engineer. It seems that there has always been an attempt to divide public health activities so that certain professions or specialty-trained people may carry them through. But it is not always possible so to divide public health problems. The problem of industrial hygiene, especially, is of many facets and must be attacked and controlled by the coöperative effort of many trained individuals. I can think

of the educator, the physician, the dentist, the nurse, the biologist, the chemist, the first-aid, several types of engineers, the psychologist, and many more.

It may easily be necessary for these specialty-trained individuals to step over the boundaries of their particular fields, giving advice and service on the whole aspect of industrial health work. This may be particularly necessary in small plants where efforts of technical people are spread so thin. The public health engineer is continually plagued by this necessity of going outside his field into medicine, chemistry, first aid, nursing, education, and others. This will become more and more pronounced as the tendency of making occupational disease work into a full and complete program of industrial health continues.

Thus, when it is said that the engineer is particularly concerned with the control of the environment, it will be realized that this is not a hard and fast rule. The environment which the industrial hygiene engineer attempts to control may be not only the working environment, but may include the home, food, recreation, and all the multitude of materials and conditions which surround the individual. However, the employee outside of his working hours is merged into the general public and will be included in the health measures carried on for the general public. It is possible to influence his personal life and environment in general by engineering health services given during the working time, but up to the present such efforts have been largely educational or medical—not engineering—and have been confined to the large plants.

Thus the need for engineering health services reduces to a control of the working environment. It includes occupational disease exposures, accident exposures, sanitary facilities, welfare facilities, food dispensing, ventilation, noise, illumination, plumbing, time and

motion studies, plant layout, and many other conditions which may have engineering aspects and require engineering knowledge for their control.

There is no need to elaborate on how these problems are controlled. But how can such technical knowledge and training be supplied to the small plant?

As with nursing, medical, and other services, it is possible and advisable for small plants to pool their resources, join in a coöperative arrangement, and thereby be able to buy engineering services. This has been done to a rather limited extent with private consultants, with trade organizations, private foundations, professional organizations, manufacturers' associations, etc. The valuable service rendered by insurance inspectors and engineers is an example.

These arrangements have worked out well for some of the small plants, but sufficient time and attention and sufficient specific information are not always given so as to solve the engineering health needs of the small plant satisfactorily, and there will be some plants which will not or cannot be reached by coöperative agreements.

It is very likely that the most direct and complete approach to the extension of engineering health service to small industry is to be performed by state and local health departments, state labor departments, and similar official organizations. In order to discharge their official responsibilities, they will, of necessity, devote more and more of their efforts to small industry. This is a form of public subsidy and should be recognized as such by providing budgets and personnel which are adequate for the amount of work to be done.

Before the official agency can adequately serve the small plant, it must overcome at least three difficulties:

1. It must overcome the prejudice which exists in the minds of small plant managers



against regulatory agencies. By example of good service and fairness, this can readily be overcome.

2. It must forget the old idea that industrial hygiene is merely occupational disease control. It must render a complete engineering health service to industry. For instance, mechanical ventilation plans should be reviewed, sanitary facilities, cross-connections, etc., inquired into, and engineering health standards promulgated.

3. It must solve the problem of large numbers of plants to be serviced, and must change its program and concepts so as to include the small plant.

For example, the value of educational methods in public health work is generally appreciated by public health people. An educational campaign of one type or another can be very successful in providing technical advice to small industry, if the material can be made attractive so it will create interest and be read, if it can be made relatively non-technical in language, and if it can be given the wide distribution that is necessary.

Small industry management does not attend medical society, nursing society, safety council, chamber of commerce, and professional engineering society meetings; nor does it read our public health publications, our medical, nursing, and engineering journals.

Unfortunately, most of the educational efforts in industrial hygiene have been limited to this type of attack; one which will reach the large plant management but not the small. In St. Louis, if we want to circularize the small industries, we must prepare literature for over 2,000 plants. When the amount of technical material to be transferred and the small portions in which it must be passed out are considered, it becomes evident that a complete educational program for the small plant is no simple matter. It will take thought and time, and the program will be slow, but the result will be well worth the effort and cost. Is there

an easier way to reach these many industries?

What do the managers read? Where do they go? The answer, unfortunately, is that they are part of the general public and have practically no distinguishing features. We cannot hope to educate the general public to technical details or methods of industrial hygiene. The avenues of approach to the small plant are reduced to only a few—trade journals for some, trade organizations for some, but principally direct mail and direct contact, with the attendant difficulty of large numbers. Some types of information may be circulated through the labor organizations and through employee groups, expecting that it will reach upward to the small plant manager.

Not only in the educational campaigns, but also in plant inspections and studies, in plan examinations, and in direct contacts, will it be necessary to spend more time and more effort in the small plant. The methods of control learned in the large plant must be adapted for use in the small one. In order to do the mass work necessary, we must standardize our methods to a greater degree.

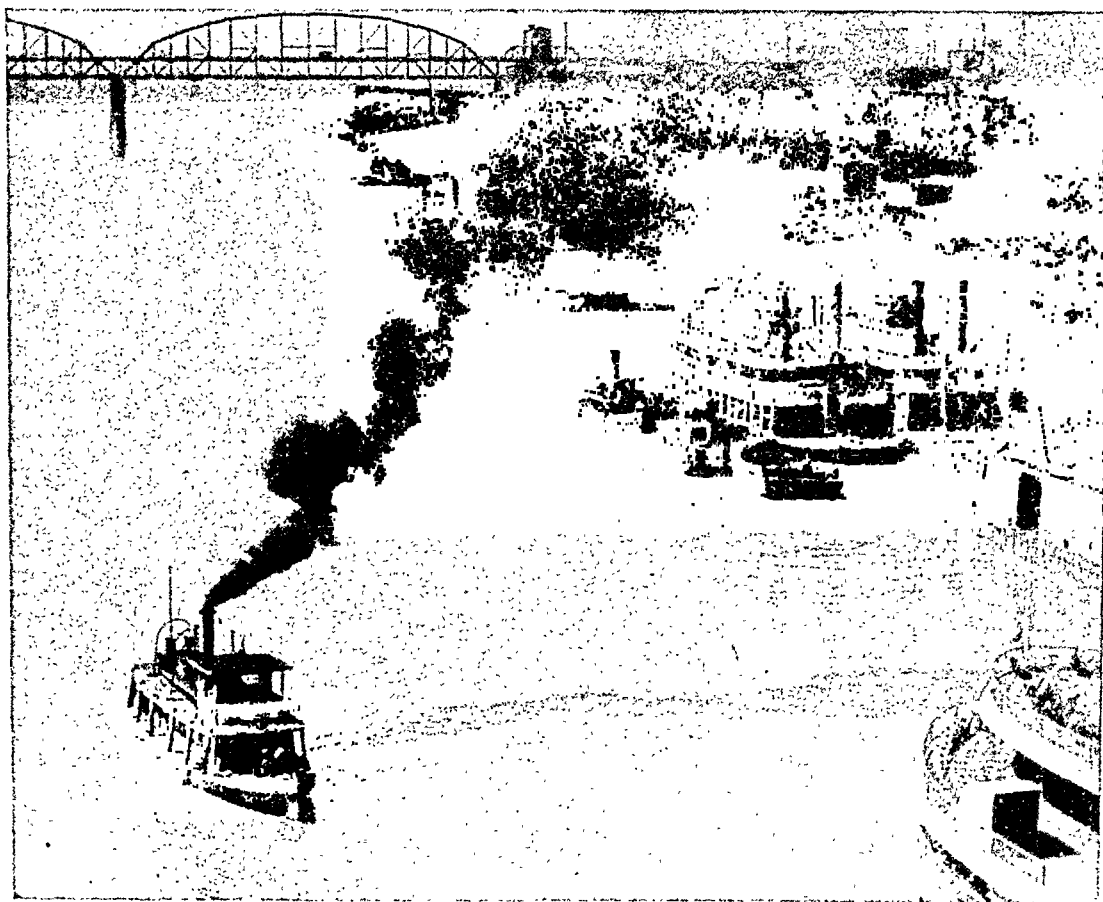
That defense slogan "It is later than you think" can be paraphrased to read "It is bigger than you think," and then it may indicate the problem of extending health services to small plants.

Perhaps I have included more than would properly be included in a paper devoted to engineering services. If so it is because it is not possible to divide the problem we are discussing in this symposium into compartments for the exclusive use of physician, nurse, and engineer. Coöperation between all the necessary technical people, which is important in the large plant, is also important in the small one. And the real difficulty is not so much a technical one as it is an administrative one; it is that of reaching the small plant

with these health services, no matter which professional group or individual is attempting it.

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"Ole Man River—she just keeps rollin' along." Visitors to St. Louis are especially anxious to see the Mississippi, the world's most colorful waterway.

A.P.H.A. SEVENTY-FIRST ANNUAL MEETING—OCTOBER 27-30, 1942.

# Medical Services in Small Industrial Plants\*

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AN increasing amount of attention is being given to health problems in industry, but the criteria for grouping plants according to size are none too clear. To some people, all industrial plants having under 500 employees each are small, while to others the size is judged principally in terms of floor area, massiveness of machinery used, or the type of products manufactured. It has been pointed out that plants having under 500 workers usually cannot economically afford to provide their own complete programs of health protection. While this may be true, the needs for industrial health service should not be based solely upon the number of people employed, but upon a combination of circumstances, including the types and magnitude of health problems and the economic means for controlling them. A plant having 300 employees might have greater health hazards and might be more able to deal with them than another establishment, of a different type, having 600 employees. No effort will be made here to define or describe the small plant because such a classification would include too many different attributes to permit a concise definition covering all industrial establishments and their problems. It is conceded, however, that the plants which may be considered within the scope of this dis-

cussion usually will have under 500 employees, and that those having under 300 each will constitute a very large majority of the group.

It is also desirable to point out that no attempt will be made to lay out a pattern of medical service which can be installed in any industrial plant in the same general manner as that involving a conventional type of press or machine tool. The type and extent of health care needed in a given plant should be based upon the various health problems involved and such determinations should be made in the same way as that used in the development of a complicated manufacturing process, or the construction of a specified type of plant building.

To say that a certain plant employing 450 people should have a part-time general surgeon or physician and a full-time nurse is not adequate or scientific unless it has been determined through analysis of the various problems in the plant that these services will be adequate. A careful study might reveal that the services of a physician having special training in industrial medicine would be necessary, and that two trained industrial nurses should be employed instead of one ordinary nurse. Industry represents one of the greatest markets for medical service to be found today and the potential purchasers far outnumber those who now provide modern medical programs. They are interested in procuring any equipment and services which will be advantageous and

\* Read at a Joint Session of the Industrial Hygiene and Public Health Nursing Sections of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 15, 1941.

they will be much more interested in the "blue prints" and "specifications" of medical programs designed to meet their needs than in the "pig in the poke" variety.

#### MODERN INDUSTRIAL MEDICAL SERVICE

The kind of medical program being considered for small industrial plants is of the same general type as that to be found in the larger industries. They differ quantitatively rather than qualitatively. Modern industrial medical services are not limited to the surgical repair of accident victims but they also include all measures necessary to safeguard the health of the employees adequately, regardless of what their jobs or occupational environments might be. A staff of several physicians, nurses, and other workers might be required to carry out such a program in a large plant, while in a small establishment these same services might be rendered by a part-time physician and a part-time or full-time nurse. No plant should be considered too small for at least the part-time services of a physician and a nurse and, generally speaking, the larger the plant the greater is the need for more constant service until the size is reached where the nurse and later the physician should be employed on full-time bases.

#### THE INDUSTRIAL PHYSICIAN

The modern industrial physician recognizes the broad scope of his duties and is willing to render the type of service indicated in the plant with which he is associated. In addition to his basic medical training and special qualifications in the field of surgery, internal medicine, etc., he presumably also possesses professional skill to cope with all the occupational health problems which do or may occur in the plant. It would be impossible to itemize all of these duties here but they can be grouped under the following heads:

- Physical examinations (including preëmployment, periodic and terminal)
- Treatment of occupational disease and injuries
- Emergency care of non-occupational disorders
- Supervision of nursing, first aid and related services
- Inspection and medical supervision of the work conducted in the plant
- Control of sanitation and plant housekeeping
- Other technical and educational efforts to protect the health of workers
- Studies of the causes and effects of injury and illness, and of absenteeism

The modern industrial physician is not just the plant doctor who operates a "repair shop" for accident victims. He is the medical director and as such should be concerned with all of the industrial therapeutic and preventive measures necessary to safeguard the health of the entire plant population. Just as in handling individual patients, he should take problems of plant hygiene "home" with him and plan how best to handle these problems.

#### THE INDUSTRIAL NURSE

The industrial nurse is no longer visualized as just a finger wrapper. The scope of industrial nursing service has been outlined many times, but only to the extent of setting forth the basic phases. The entire field need not be described in detail because the real industrial nurse does not need such a guide book. But she appreciates advice and consultations on her efforts. Her skill, enthusiasm, and persistence will determine whether she will be looked upon by the workers as a nuisance or as an asset.

Although the personnel of the small plant medical department usually is limited to the doctor and nurse, other workers, such as trained attendants\* or first aid workers may be employed.

\* The 1939 Supplement to the General Statutes, State of Connecticut, Sec. 992c, defines nursing as follows:

(Cont. on page 862)

These persons do not possess the professional qualifications of registered nurses, but it must be conceded that they can render beneficial service under competent medical and nursing leadership and that there is a place for them in the small plant. But they should not be considered as adequate substitutes for registered nurses. The plant which is too small for a full-time registered nurse certainly should be able to provide this service on a part-time basis, and any plant that has enough work to occupy the time of a trained attendant or a first aid worker on a full-time basis should be able to employ a registered nurse on the same basis, either in addition to or in lieu of the less competent workers.

#### FULL-TIME NURSING SERVICE

Many plant officials and some physicians are of the opinion that a nurse is not needed unless there are at least 300 or 400 employees on the pay roll. There are many excellent examples to disprove this idea and one of them is cited here:

A plant in Connecticut having 150 workers recently employed a registered nurse on a part-time and probationary basis. She was instructed to take care of the first-aid work and to spend her spare time on the assembly line with other women employed in the plant. At the end of the first month she went off probation, and from part-time to full-time as the plant nurse. By this time she had several outstanding accomplishments to her credit, including the following:

(Cont. from page 861)

- a. (Registered nurse) The performing, for compensation and under the direction of a licensed physician, of any professional service requiring special education, knowledge and skill in nursing care of those mentally or physically ill and in the prevention of illness; or
- b. (Trained Attendant) The performing, for compensation and under the direction of a licensed physician, of any of the simpler procedures required in nursing care of the sick, not involving the specialized education, knowledge and skill specified in subsection (a). Effective July 10, 1939.

1. The transfer of a worker from a machine, which he could not operate properly because of a visual defect, to a suitable job

2. The transfer of a degreaser operator, showing evidence of addiction to trichloroethylene, to a safe job

3. The correction of hygienic practices and proper protection of two machine operators having moderately severe oil folliculitis, with the result that the trouble cleared up without the men having to lose time from work or be transferred to another job

4. The discovery and transfer of an epileptic worker from a job which would have been hazardous to himself and others in case of a seizure, to a safer job

All of these adjustments were brought about in a manner which was mutually acceptable to the men and the plant officials. This nurse is more than a first aid worker. She is practising a type of modern preventive nursing which is reaching all of the employees, and even into the homes of many of them. To say that the plant officials and workers are satisfied with her services is expressing the case very mildly.

This example of what a full-time, registered nurse can do in a small plant is unique in some respects but there undoubtedly are many other similar examples. Much proof also can be cited to show what the part-time physician can do in such plants. The nurse mentioned above has received excellent assistance from the physician who serves the plant on an on-call basis. If this physician had been employed on a part-time basis the accomplishments undoubtedly would have been much greater than they were.

#### MEDICAL SERVICES IN INDUSTRIES

In view of progress in the field of industrial medicine it hardly appears necessary to present an argument for the service. But as proof of the enormous promotional task ahead, two examples of the present shortcomings are cited here. A recent survey of potential industrial hygiene problems in the United States,<sup>1</sup> covering 1,487,224 work-

ers in 16,803 plants, revealed that full-time and part-time services of physicians were provided for 15.5 per cent and 22.3 per cent, respectively, of the employees, while nursing care was provided on these bases for 33.3 per cent and 1.5 per cent, respectively. In the State of Connecticut a recent study<sup>2</sup> involving 116,639 workers showed that full-time and part-time physicians were provided for 22.7 per cent and 18.8 per cent, respectively, and that registered nurses were serving 67.4 per cent and 2.5 per cent on these same bases. These figures represented the extents to which services of physicians and nurses were available for employees in all of the plants covered. The shortcomings were much more graphic in the smaller industries.

#### FUTURE PROSPECTS FOR INDUSTRIAL MEDICAL SERVICES

The prospects for further development of industrial medicine are very promising. The subject is at long last, and for the time being at least, receiving a measure of attention which is justified. The impetus which has been given to the physical welfare of industrial workers during the past few years has been motivated by the growing conviction that good business and good health are inseparably related, and that industrial poor health is an unnecessary and expensive industrial waste product.

At the present time almost all Americans are rapidly becoming "tooled up" to a wartime tempo with preparedness, defense, conservation of resources, and other related topics dominating the entire picture of American life. Of the many types of resources considered under the benevolence of conservation, and on the priority lists, none is of greater individual and national importance than the physical stamina of industrial workers. It is only natural, therefore, that industrial medicine

should be elevated to the level of importance which it now occupies. But if effective service is to be sustained in this sphere, it is necessary that all of the related problems be understood and dealt with soberly. Furthermore, it must be realized that whatever heights are reached during the present national emergency probably will not be entirely adequate even for normal periods of industrial activity. So the present programs for the extension and improvement of industrial medical service must be prosecuted, not only for the purpose of protecting defense workers, but to insure to all future employees safer working conditions than were found at the beginning of the present emergency.

#### THE CONNECTICUT PLAN FOR EXTENSION AND IMPROVEMENT

Although a very large percentage of industrial workers still are without adequate health service, there are many encouraging indications that the medical and nursing professions will do their part to eliminate this shortage. The interest which is being manifested in the State of Connecticut serves as an excellent example. The Connecticut State Medical Society and the Manufacturers' Association of Connecticut have been coöperating for some time in studies of the industrial medical problems and of ways and means of improving and extending the service. The basic policies and objectives already have been set forth in a brochure, *Conservation of Man Power Through the Extension and Improvement of Industrial Medical Service*. A second step which now is in its final stage of completion involves a statistical study of the extent to which medical care and facilities are provided in Connecticut industries. The third, and by far the most important step, involves a state-wide effort to point out the importance of adequate industrial health protection. This campaign will deal with two major

groups — physicians and individual plants. Some phases of the project already have been started but they are to receive much greater attention in the near future. The medical profession will continue to sponsor postgraduate training in industrial medicine through seminars, special society programs, and other means which may be indicated as the program expands.

The Manufacturers' Association certainly can be relied upon to enlighten industry further concerning the importance of adequate medical care of workers. In addition to the general promotional efforts which these two organizations will carry on, plans are being further developed for rendering consultation service to individual physicians and plants concerning their specific problems.

Organized labor long has been concerned with industrial health problems, and labor leaders have made very substantial contributions to the drive for better working conditions in Connecticut. They, too, can be counted upon for continued coöperation and their efforts already are being reflected by the individual workers, who are displaying intelligent and constructive appreciation of their responsibilities in this field of a higher type than ever has been observed.

Tribute also should be paid to the industrial nurses in Connecticut. They realize their opportunities and responsibilities to coöperate with others in measures which will elevate and extend the service. Leaders among the industrial nurses in the state feel that their branch of the profession is, or should be, on the same high plane as those which are limited to private nursing care of the sick, public health nursing, or other special fields. They are proceeding along the same general lines as those mentioned above for the physicians, and it may be confidently predicted that this field of service soon will surpass any previous levels of perfection.

The Bureau of Industrial Hygiene of the Connecticut State Department of Health has enjoyed a close coöperative association with the State Medical Society, the Manufacturers' Association, and industrial nurses, in the various phases of the program outlined above. The bureau has no specific responsibilities or duties in regard to industrial medical service, and only proposes to render helpful assistance. It is felt that, if each plant in the state could have adequate industrial medical service, much more effective control of occupational disease hazards could be realized than is the case today. The bureau naturally is anxious to coöperate in any measures which will be for the attainment of this goal.

This outline of organizational and promotional effort in Connecticut was given here to show that logical and sensible efforts are being made in more than one camp to bring about the type of industrial health protection which will be adequate to meet the needs in individual plants and which will be respected and utilized by the beneficiaries. These services will be offered to industries on "tailor made" bases so as to insure that the type and extent of care needed, as revealed by specific plant surveys, will be provided. The small plants will be on the priority list, and every effort will be exerted to guarantee their workers medical care equal in quality to that to be found in the larger plants. This program is not simply concerned with the present industrial situation but is also being developed with the objective of insuring to all industrial workers that every effort will be made to protect them against their jobs and their jobs against them.

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# American Journal of Public Health

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## A CALL FOR PUBLIC HEALTH STATESMANSHIP

IT seems quite probable that as the war goes on, a medical situation, heretofore somewhat humdrum and certainly neglected, will assume such proportions as to demand solution. This is the problem of distribution of medical practitioners. Thoughtful physicians, public health workers, and many of those in fields collateral to medicine have been worried about this matter for a number of years. That there has been a plethora of physicians in urban centers and a dearth in rural areas has been no secret. It has been well known, too, that the ratio of physicians to population in one section of the country has been markedly out of proportion to that ratio in another.

The factors which have contributed to this situation are fairly obvious: adequacy of hospital facilities in one place as against their absence in another; the mental stimulation of the medical center in contrast to the danger of professional stagnation in the outposts; the more abundant life socially, culturally, and financially in the urban and prosperous communities, and the lack of these inducements and advantages where there are few people and less money. Occasionally some community, with the only practitioner dead of senility, has gone so far as to offer a subsidy in an effort to attract a physician to settle there, but in general no group has seemed willing or able to undertake, systematically, the solution of this problem. Of the many deterrents, two perhaps have been foremost. First, and quite properly, no governmental or non-governmental agency has had the authority to tell the young physician that he must go to a certain place to practise and make his home. Second, there has been the fear that any wide-scale activity related to the placement of physicians, even in an advisory capacity, might lead to some form of regimentation of the medical profession and to socialized medicine. The result of all this has been what one would expect: demand and supply have operated in a manner not nearly so satisfactorily as the *laissez-faire* group would have the public believe, but not nearly so distressingly as is proclaimed by those who, afflicted with a sort of phantom sociorrhagia, bleed vicariously for mankind.



Be all this as it may, it seems likely that the channeling of physicians into the military services will transform what was in the past a tolerable situation into an intolerable one. As nearly as can be gathered, the distribution of physicians in the United States, by ages, is somewhat as follows: under 36, some 42,700 or 24 per cent; ages 36-44, about 38,200 or 21.7 per cent; 45-54, approximately 31,900 or 18.1 per cent; and 55 and over, around 63,300 or 36 per cent. It is the 80,900 physicians under 45 years of age in which the military services are most interested, interested to the extent of needing 45,000 (including those already in the services) by December 31, 1942. This means about one out of every two physicians in that age group will be lost from their communities. And this will not be the last of it. Present indications are that, barring some unforeseen collapse in the Axis powers, the war will be a long one, and further and continuing inroads must be made on those who will be engaged in civilian practice in 1943 and 1944, and on until the end. Common sense indicates that measures must be taken to insure, on a national basis, the most sensible and effective use of those comparatively few civilian physicians who are not called to military service.

It seems exceedingly doubtful that this best use can be assured on a voluntary basis. It is hard to visualize a physician, with a comfortable urban practice, voluntarily abandoning his local prestige, his hospital affiliations and facilities, his accustomed routine, and his assured income for the exigencies of what, in many ways, would be a new start in uncomfortable circumstances, with the nearest hospital thirty miles away. And one cannot blame the physician for failing to volunteer for this sort of work, especially as some of his competitors would remain in the community he had left, would serve his patients, and when he returned some years older, he would not only have lost his practice, but would have to meet the competition of the returning medical officers with their hard-won right to preferential consideration.

Is the answer to the problem to draft all physicians into one of the present services, or a service to be created, and detail them to this place or that, as is done in the Army, Navy, or Public Health Service? We do not know the answer, and, at the present writing, we are inclined to suspect that anyone who is aggressively sure that this is the answer, or is similarly aggressive in saying it is not the answer, evidences prejudice and approaches error in direct proportion to this vehemence. And it is unlikely that either the threadbare clichés of the traditionalists or the wails of soap-box socialists will contribute to solving the problem. It was all right to listen to these champions in the leisurely days of peace, but with the situation as it is, they come under the general heading of annoying, if not dangerous, pests. But time is passing, and increasingly the problem presses for solution. Unselfish and authoritative leadership, with first interests focused on solving this problem, is what physicians and the people now want. And they want it very much and at once.

## WHAT AND WHO IS AN EPIDEMIOLOGIST?

*Comments on an editorial published in the April, 1942, issue of the JOURNAL.*

Our thanks are due John R. Paul, M.D., Professor of Preventive Medicine, Yale University School of Medicine, for the following:

In seeking the answer to the nice question posed I am prompted to define certain qualifications which one might seek in a man to head up a department of epidemiology in a hypothetical medical school. These qualifications depend, of course, on one's definition of Epidemiology, and, if forced to give this in a sentence, one could say that Epidemiology is that subject (not yet elevated to the position of a science) which deals with the circumstances under which people get sick. Such a definition does not imply that epidemiology is limited to infectious diseases or to epidemics, or that one necessarily has to deal with *many* sick and *many* well people in order to "practise" epidemiology. Zenker elucidated the epidemiology of trichinosis from one case; and there is a growing list of examples of the study of *familial epidemiology* in which much was learned from but a few families.

With this clinical approach in mind, the qualifications of our hypothetical candidate should consist in:

*A clinical background*—He should not only have had clinical training but it is desirable that this training should have struck deep enough into his soul so that through the greater part of his working life he could maintain the clinician's point of view, because epidemiology deals with sick people. This maintenance of the clinician's point of view does not necessarily mean that he must keep up membership in the county medical society, but he should keep up contact with patients and should bring *clinical* judgment to bear on his prob-

lems rather than other types of judgment. He should not have to resort to scattergrams to show that all individuals of the same age group are not alike. His diagnostic methods are apt to be more like those of a detective than of a "trouble shooter." He should regard all clinical data with healthy suspicion.

The training for this should be an M.D. degree, an internship, and perhaps an assistant residency on either the medical or pediatric service in a good hospital; or even an assistantcy in one of these departments in a medical school. This experience should serve to put our candidate on either one or the other side of the fence, which separates the sheep from the goats. The distinction is important, if we believe in the words of Dr. Theobald Smith, who stated that by their very nature the clinician and the public health man use different methods in their approach to problems of human disease.

*Bacteriological training*—Early in the candidate's postgraduate career (probably during his assistant residency) he should be exposed to a certain amount of *responsibility* in the handling of bacteriological methods. These methods should include work with bacteria, viruses, or protozoa, and work in clinical immunology—subjects which perhaps come to life best in a hospital laboratory. Such clinical bacteriological training is important, but of course it is only one part of the picture, for bacteriology is certainly not epidemiology.

*Statistical training*—Having followed

our candidate through a clinical and laboratory course of sprouts, we come to the most difficult part of his training. He should be willing to interrupt his career long enough to familiarize himself with statistical methods so useful to the practice and study of epidemiology. Knowledge of such methods is of great value. That they are the beginning and end of epidemiology is doubted, even though one occasionally finds a "portentous epidemiologist" who seems to be equipped only with statistical tools and someone else's figures.

*Experimental epidemiology*—It is also possible, though unlikely, that our candidate may have taken a year off to try his hand in the field of experimental epidemiology; but so far relatively few investigators have developed this important subject.

*Experience with field work*—Our candidate would be fortunate indeed if early in his career he could have the opportunity of applying his bacteriological and statistical methods in the study of disease in the field (*viz.*: in the home, in an institution, in the factory, or in a small or large community). This experience is really training in Clinical Ecology—and if it "took," he would probably never be happy doing "office" work alone.

*Experience with "public health epidemiology"*—Useful also would be some

experience in the epidemiological division of a municipal, county, or state department of health. Probably more positions of this type exist than in any other branch of the subject, and so it is this particular aspect that comes to one's mind when the title "epidemiologist" is mentioned.

*Formal training*—The question of formal schooling, of degrees and courses in epidemiology might be raised. Such training would be nice but it seems to be the least valuable of the experiences already mentioned. It carries with it the risk of substituting overtraining or stagnation in lecture halls for years that might better have been spent in enthusiastic work in the field or laboratory. The advantages of such training are that they may aid an individual in his search for certain kinds of jobs. But while theoretical training may be an introduction, it should never be a substitute for the practical experience needed by our candidate.

At this point it becomes obvious that one would have to seek far to find our candidate. Perhaps there are no such individuals and no medical school ready to use them. Perhaps this is the real answer to the question which the editorial has raised, and so the discussion as to what and who is an epidemiologist really brings us to another point, namely: Where is there an epidemiologist?

Signing himself as "Retired Epidemiologist," Allen W. Freeman, M.D., Professor of Public Health Administration, The Johns Hopkins University, lets fly this searching but good-natured broadside:

The epidemiologist is the fellow who gets to town at the peak of the epidemic and coasts to glory on the down or eastern leg of the epidemic curve. He goes around with a sheaf of case cards in his hand and knocks on front doors, asking impertinent questions. When he has drained the community dry of what

he then calls pertinent information, he goes into a huddle with a Monroe machine and comes out with a paper for the Epidemiological Society (by invitation). When he is too old to walk from car to door he becomes a statistical or armchair epidemiologist, or in extreme cases a professor.

Epidemiologists are not born ready made. Like diamonds, they are produced by the prolonged and skillful shaping and polishing of suitable raw material. Many sorts of raw mate-

rial may be processed into epidemiologists, even, occasionally, bacteriologists. County health officers seem to make the best product.

James E. Perkins, M.D., Director, Division of Communicable Diseases, State Department of Health, Albany, N. Y., says this, in a letter to the Editor:

I cannot completely ignore the shoulder chip flipping Editorial in the April, 1942, issue of the JOURNAL. It really is not surprising, however that a query is made as to the means of identification of an epidemiologist since there are no obvious insignia designating these rare individuals (particularly rare if one confines discussion to the "epidemiologist vera"). Even the Johns Hopkins School of Hygiene and Public Health doesn't give a degree of "Doctor of Epidemiology," so it is obvious that an epidemiologist cannot substantiate his status by a beautifully scrolled certification to that effect. But an *epidemiologist* can tell *another* epidemiologist unerringly. It's like sex in the flea: "the sexes look alike, you see, but *he* can tell, and so can *she!*"\*

As hinted above, there are two classes legitimately designated as epidemiologists. The first class comprises a broad group of individuals ("epidemiologist expansa") who are more or less authorities in "the science of mass pathology." A layman who has engaged in researches entirely devoted to gleaning from past literature shifts in the geographical and chronological distribution of diseases may perfectly well qualify as an epidemiologist in this class. He may, in fact, be much more entitled to the designation than a recent medical school graduate who, in order to fill empty and somewhat ragged pockets, accepts temporarily a position bearing the title "epidemiologist" in a local or state department of health.

Then there is the narrower definition

of "epidemiologist." This restricted use of the term refers to an individual who, through training, but chiefly through heredity, has an unusual capacity to ferret out epidemiological data through actual field investigation. He is an individual who, as Dr. Godfrey says, has "an insatiable curiosity and a healthy skepticism." But he must have other qualities as well. He is merciless to shoe leather. He has a tactful aggressiveness and a reasonably thick hide, which enables him to ascertain from the housewife, as she does the weekly wash, the exact day two and a half weeks ago Aunt Hattie from the city visited the home with her ailing youngster, and enables him to secure specimens of body fluids or discharges in spite of a reluctance on the part of the owners thereof to part with their precious secretions or excretions. It is in this latter restricted sense that one hears the statement, "Now, there's a true epidemiologist!" Hence, the species designation, "Epidemiologist vera." Even though this is a more restricted group, its membership distinctly is not confined to physicians. Many a public health nurse and lay investigator has been appropriately revered as an *Epidemiologist vera*.

The one quality which I have yet to see in one considered to be an epidemiologist by those capable of evaluation is "portentousness of manner and mien," mentioned in the Editorial. Epidemiology is a science, and an epidemiologist worthy of the name has the humility, objectiveness, and dislike for affectation characteristic of the scientist.

\* Source forgotten.

# Credit Lines

A Selective Digest of Diversified Health Interests

D. B. ARMSTRONG, M.D., AND JOHN LENTZ, M.S.

## THE PUBLICATION PARADE

There is one very stimulating thing about writing a health education section for the *Journal* and that is we seldom have to plow through a lot of uninteresting material in order to unearth publications worthy of endorsement. Rare indeed are there publications which are so inferior that we think best to cast them aside. Here, then, are some items which have brightened our days during recent weeks. At the head of the summer publication parade, we would place:

*The New Milwaukee Cook Book*, issued by the Visiting Nurse Association, 1038 North Cass Street, Milwaukee, Wis., and priced at \$1.50 per copy. (Spirally bound.)

Most cook books, at least to the average person, are about as interesting as worn-out vaudeville jokes. But the Milwaukee group has succeeded in presenting a cook book that is novel, original, and attractive. The first section of this publication is entitled "The Cocktail Hour" and it lists "the makings" of a number of favorite drinks from mint julep to eggnog. Following this section, the book is given over to the pet recipes of various Milwaukee citizens—and the mere reading of these is enough to create a healthy appetite. The recipes, incidentally, are not printed in type, but are reproduced in the penmanship of the various contributors. Humorous pen-and-ink sketches appear throughout the con-

tents. From the standpoint of the mere male reviewer, the only criticism that can be made of this publication is that the recipes might be a bit more detailed. On the whole, however, this cook book is excellent and should enjoy wide popularity. Other health agencies seeking ways of raising funds should examine this, for it has all the appeal of a best seller.

*This Is Medical Care in Connecticut*, published by the Connecticut State Medical Society, New Haven, Conn.

This is a distinctly admirable publication and to our knowledge no other state medical society has succeeded quite so well in interpreting the physician, in his various capacities, so comprehensively and attractively for the information of the public. By means of photographs and a few words of text accompanying each picture, a complete review of public health and personal hygiene measures in Connecticut is conveyed to the reader. In fact, extraordinary skill in condensation is one of the distinguishing features of this booklet. The booklet is an effective educational device and it should create among the citizens of Connecticut a feeling of pride in the medical resources available to them.

*National Foundation News*, a periodical published by the National Foundation for Infantile Paralysis, 120 Broadway, New York, N. Y.

Although this is not quite a new publication, it has recently been re-designed and is now appearing in a new streamlined format conceived by Normal Bel Geddes, the famed originator of the

Please address samples of printed matter, comments, or other editorial contributions to the editors at One Madison Avenue, New York, N. Y.

Futurama. and creator of the modernized Ringling circus. It is hardly necessary to add that this publication is up-to-the-minute as regards layout and typography. These features, combined with the publication's unusually well written news items, make this a periodical worthy of forthright critical approval. Incidentally, have you seen the promotional letter sent out by the Foundation on its film, "A Report to the People"? Aside from the convincing copy, reader interest is stimulated by a novel device attached to the stationery. It consists of numerous "stills" from the film, folded accordion-like, and printed to simulate a strip of motion picture film. This gives the prospective booker of the film a "preview" on paper, and the effect is quite pleasing.

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Several noteworthy annual reports ranging from modest, compact statements to expensive and elaborate presentations, deserve recognition in this publication parade.

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We commend Dr. I. F. Thompson, Commissioner of the Racine, Wis., Department of Health upon his summary of activities for the year 1941. In this report, a new technic of interpreting health work is utilized. Readers may recall an article by the late Dr. W. Frank Walker entitled "Rating My Town's Health Work" in which Dr. Walker took accepted standards of health conditions and health procedures and presented them so that one might be able to judge whether health programs in any community measured up to accepted standards. In the Racine report, Dr. Thompson has ingeniously used the yardsticks of Dr. Walker to measure the work of his department so that the people he serves may know how nearly their health agency approaches desired standards. Quotations from the article of Dr. Walker, pertaining to various

phases of health department activities, are printed in red. Accompanying these quotations, are notations regarding the Racine activities. It is an excellent scheme and it makes for a singularly interesting and readable report. Another touch that we like is the signature of Dr. Thompson at the end of the foreword. It is not a facsimile reproduction, the Health Officer having signed the reports personally. As for content, the 1941 statement reflects a most outstanding record of progress on the part of the Racine Health Department.

Other 1941 annual reports of considerable merit include the following:

*Mental Hygiene—Ally of Victory*, published by the National Committee for Mental Hygiene, Inc., 1790 Broadway, New York, N. Y.

Here is a report which prominently features the relation of mental hygiene to the war. "Clear minds and unclouded vision" are necessary if we are to put forth our best effort, and the report points the way to bring these about. The cover, illustrations, typography, and text of this statement are done with outstanding skill.

*Annual Report of the Children's Memorial Hospital of Chicago*—Enhanced by an appealing cover portrait of a young child, well organized contents, and exceptionally good illustrations, this report stands head and shoulders above those issued by most hospitals. Being safety-minded, we were surprised to note that one of the photographs in this volume unconsciously pictured a most conspicuous indoor accident hazard (page 61)! Aside from this flaw, the entire report is indeed meritorious.

Two reports that reflect the current trend toward the compact, abbreviated type of annual statement come from the National Tuberculosis Association and the New York Tuberculosis and Health Association. Both are brisk, readable, and well printed little

volumes. While the longer report may be more satisfactory for certain purposes, we like the "capsule comment" of each of these statements. Both reports are pleasingly bound, and we congratulate the writers for packing a considerable amount of material into a limited amount of space.

#### AN EDITORIALETTE:

##### "NATURE'S COURSE"

Herewith we offer our first guest editorialette, submitted in response to invitations extended in these columns during recent months. Dr. Bruno Gebhard, Director of the Cleveland Health Museum, has written the following:

"Let Nature take its course" is one of those sayings which can be quoted rightly or wrongly. Nature is Man's friend and enemy. Man has learned to use Nature's powers to build up what we usually call civilization and culture. But he has also used Nature to tear down civilization.

More and more we are moving away from Nature but are still a part of her. Nature's "course" is practically, "How shall we live, and how shall we live together?" In preventive medicine we no longer allow Nature to take its course. We vaccinate and we immunize. We do not allow people to become ill where it is not necessary.

Too often parents and teachers refer to Nature's course, trying to dodge educational responsibilities. There is no doubt that the recommendation "Let Nature take its course" is justified where experience means more than knowledge. But there is no excuse for holding back facts which should be known by everybody. Ignorance is seldom bliss or identical with purity.

(EDITORIAL NOTE: These columns are still open to other contributors. Please let us have your comments on any subject—preferably with a health education slant. While we cannot guarantee publication, serious consideration will be given to all material submitted.)

#### RADIO NOTES

Two volumes of radio scripts—each containing 26 separate dramatizations on a wide range of health topics—are

available from the Baltimore City Health Department, Baltimore, Md. These volumes are a compilation of the radio programs that have recently been sponsored by Dr. Huntington Williams in his "Keeping Well Series." Each volume is priced at \$5.00, while copies of individual scripts are offered at a cost of \$1.00. In view of the excellence of the material and the substantial way in which these scripts are bound, we commend this as a good investment for any health department interested in inaugurating a radio program.

The "Keeping Well Series" has been aired from Baltimore over a period of several years and is considered one of the most conspicuously successful health radio programs yet offered the public. The reasons underlying Dr. Williams's success in this medium are readily apparent to anyone who examines the scripts. In the first place, a versatile writing talent has gone into the preparation of these dramatizations. In the second place, in spite of frequent failure with this method in health education elsewhere, each script is built upon a good dramatic pattern—with just enough health content to put over the desired message and just enough entertainment to hold and sustain audience interest. Each of the scripts has general appeal and there is no use trying to list the best ones; everyone will have his own preference. Audiences will probably listen and learn wherever these scripts are broadcast, and health agencies would do well to look into the material offered by the Baltimore City Health Department.

"Shadow Over the House," one of a series of radio transcriptions produced by the U. S. Public Health Service, was accorded high recognition by the Thirteenth Institute for Education by Radio at a recent meeting held in Columbus, Ohio. The script, written by Oscar Saul of the Division of Sanitary Reports and Statistics, received one of the two

awards for the best dramatizations of 1941. This transcription is one of the few health education programs that have received such recognition and it is hoped that the award will result in a more general acceptance of health transcriptions by radio station managers. "Shadow Over the House," and other transcriptions dealing with varied health subjects treated in dramatic style, are available on loan without charge from the Public Health Service or the U. S. Office of Education, Washington, D. C.

"How to Use Radio" is the title of an informative pamphlet published by the National Association of Broadcasters, 1626 K Street, N.W., Washington, D. C. This publication was prepared especially for teachers and radio chairmen making their debut as program sponsors. The booklet covers the subject thoroughly, embracing such topics as the selection of speakers, script writing, preferences of the listening audience, and that bugaboo of all radio amateurs—mike fright. The booklet is priced at *3 cents per copy*.

#### A NEW USE FOR WINDOW SHADES

Lucile Hook Hamlin, Associate in Public Health at the University of California, has described an ingenious method for the presentation of statistical data in the classroom. Since many health workers are frequently required to present such material during public lectures, it would perhaps be serviceable to describe Miss Hamlin's method in some detail so that others may put it to use.

In teaching vital statistics and biometry it is frequently necessary to present graphic and tabular information to classes. Blackboard presentation is time-consuming and subject to errors of transcription. Moreover, in those classes in which the same material is used progressively through the school semester, blackboard work becomes a tedious chore. Investigation of ways in which statistical information might be permanently

and accurately recorded led to the use of paper graphs, size 3 feet by 3½ feet, mounted with vegetable paste on plywood. This arrangement, however, involved difficulties such as warping, the necessity for considerable storage space, heaviness, and expense.

A method of graphic presentation which is entirely satisfactory and practical with respect to preparation, presentation, storage, and expense is found in the use of an ordinary window roller shade. Sizes of approximately the same as that of the mounted paper graphs (3 feet by 3½ feet) can be bought at most stores. The material of the shade takes pencil and ink, it withstands frequent erasure, and does not smudge. A wide range of color selection makes it possible to obtain an off-white color that reduces glare to a minimum. The brackets which are used to secure the shade over a window may be fixed into the wall molding of the classroom. The desired shade-graphic is easily slipped into place, to be drawn at the appropriate time. If conditions permit, brackets may be secured in position in the storage room, where the roller shade-graphic may be kept when not in use. The rolled shade is easy to carry, and the graph is preserved in excellent condition.

When it is necessary to present numerous data in a tabular or graphic form for teaching purposes, the window roller shade is an inexpensive and practical method.

#### AN EXHIBIT CONTEST

Here is a good tip on ways and means of acquiring needed exhibit material—as carried out by Yolande Lyon, Public Information Secretary of the Buffalo and Erie County Tuberculosis Association, Buffalo, N. Y.:

"The Buffalo and Erie County Tuberculosis Association acquired 24 original tuberculosis window exhibits last spring as a result of a contest which it sponsored among commercial art students of the Buffalo School of Fine Arts. The undertaking grew out of a need for visual education material in a section of Buffalo chosen by the Association for an intensive health education program because of its consistently high tuberculosis death rate. The rules of the contest provided that exhibits should be no more than 30 inches in any dimension, that they should all be three dimensional, they must allow for flicker lighting effects, be of durable construction and portable, and measure up to the standards of commercial advertising matter.



"To give the participants in the contest some understanding of tuberculosis as a community problem, the health education secretary took part in the exhibit work conferences, which involved actual planning and construction by the students. The exhibits were completed within a month's time and the awards were made at a special showing and tea for the directors of the Tuberculosis Association and the Art School and other invited guests. Judges for the contest included the president of the county medical society, the director of the health department's tuberculosis division, the director of the local visiting nursing association, the representative of a Negro women's group and others. Excellent opportunity for publicity was provided at each step of the project.

"The contest had several clear-cut results. It brought to the Association 24 individually designed window exhibits which, if they had been commercially made, would have cost approximately \$500. It was a means of getting across to the Art School students and their families the facts of tuberculosis prevention. The contest was also a means of promoting good will. Today the exhibits are being circulated in the territory covered by the Association and will continue to be routed to spots where they will do the most good."

#### THE MEANING OF LOYALTY

Although the following quotation is not closely pertinent to the field of public health, these are days when loyalty is uppermost in our minds and it is appropriate that all of us, regardless of our calling, consider the meaning of this quality in its truest and fullest sense. Here, then, is a definition of loyalty as expressed by Dr. Samuel Standard, Assistant Professor of Surgery, in an address to a recent graduating class of the New York University Medical School:

"The best evidence of a friendly, understanding, tolerant, and able faculty is an alumni group that is loyal. And what is this thing called 'loyalty'? It is difficult to define. It expresses itself as a vague feeling of gratitude and affection without value received. It isn't something that is bought and paid for. It isn't purchasable on an open market. It is no 'quid pro quo' arrangement. It is created from an unprovable feeling that what was given was given open-heartedly, freely,

with only the kind hope that the recipient would find happiness and comfort in it. It is not arrived at by logical or mathematical equations. It is difficult to understand as a reasonable conclusion—it must be felt as a vague, intangible, responsive warmth of welcome, a deep sincerity, that leaves an indelible imprint which is unforgettable, and is remembered long after the deed which it accompanied is forgotten.

"Of such gossamer-thin ingredients is loyalty woven. Yet, once woven, it is indestructible; and there is no other way to weave it. It cannot be demanded, commandeered or bought. It must be earned. Any attempt to enforce it is doomed to failure. The loyalty this school expects of you is the loyalty it has earned—no more and no less."

#### JOTTINGS

When vacation days loomed on the horizon this year, one of us wondered whether we should hie ourselves away and play as usual or make our respite from the job "a busman's holiday" by visiting health departments. We decided that the latter would be a highly profitable way in which to spend a wartime vacation—and so it was. There is nothing that renews one's faith in the cause of public health so much as observing the profession in action. Thus, we return to our editorial chores fully convinced that we are fortunate indeed to have these pages at our disposal to sing the praises of a truly great calling. In our ramblings from one place to another, we met and talked with health officers, sanitarians, public health nurses, health educators, and other workers. From these associations, we have gleaned the following impressions and viewpoints. . . . Many health departments are facing crucial circumstances. Demands for health services are mounting day by day. Trained personnel is needed as never before. Yet, workers are being called from their posts to meet the demands of the armed forces. Admirable as is the response, still the home front must not be neglected. Of all structures, that of

public health should be left intact. We saw health officers almost in the throes of despair over the situation. How can we meet the public's demands with depleted staffs? This question was posed over and over again. . . . We find that the Cleveland Museum of Health is stimulating health agencies in many sections of the country to produce effective exhibits. Dr. Gebhard's pioneering work is rightly bearing fruit. . . . Careful attention is being given to the planning of community health meetings. Entertainment, as well as education, is given due consideration by program planners. . . . Health officers are becoming increasingly cognizant of the value of cultivating good press relations and the newspapers, in turn, are giving health news liberal amounts of space. . . . The colorful posters of the U. S. Public Health Service on syphilis and gonorrhea brighten the quarters of many health departments. They command the attention of the public, too. . . . "Give us more material on infant and child health" was a frequent request which we encountered. . . . Have you ever thought of a vaccination scar as "a health trade mark"? We heard a health officer ask a child if he might see her "health trade mark." She immediately responded and proudly displayed her vaccination scar. . . . Health workers, particularly nurses, are responding nobly to a tremendous job in communities surrounding defense plants. . . . The nutrition program has created widespread interest among all classes in proper foods, their consumption, and preparation. . . . We find that the articles of Paul de Kruif are widely read and quoted. . . . Dr. Harry Mustard's *Journal* editorial on telephone etiquette has had a marked effect on secretaries who are fast learning "how to win friends and influence people" over the wire. . . . The owner of a chain of theatres reported that good health films were welcomed by his

patrons. . . . The following slogan, used by a candidate for a public legal office, was noted: "Elect me and I will help build a wall of health around this community." . . . And speaking of slogans, we saw this one (not in a health department, mind you!) in a drugstore which was promoting the sale of a well known deodorant: "Under arm defense—for a nation under arms." And that, it strikes us, is the height of something-or-other in slogan phraseology. . . . Prediction of a health officer: "Following the war, public health will truly come into its own. The public now recognizes its great value to humanity and tomorrow's world may well bring the golden era of the profession."

ADDENDA: Two more slogans received just before going to press—(1) "Today's Ills Equal Tomorrow's Bills—Today's Health Equals Tomorrow's Wealth" (from Florence Fiske of the Kalamazoo, Mich., Tuberculosis Association, (2) "Health Is a Go-Sign to Victory" (from David H. Meimelstein of Baltimore, Md.). . . . If you have access to *The Lancet*, one of the leading British medical journals, do not fail to read its weekly feature entitled "A Running Commentary of Peripatetic Correspondents." You will be amused, delighted, and enlightened by the varied observations recorded in this unique bit of medical journalism.

#### MAGAZINE ARTICLES

Recent popular magazine articles on health or of medical import:

"Discovered: An Accident Germ." Gretta Palmer. *Coronet Magazine*, July, 1942.

"The Threat of Undulant Fever." Harold J. Harris, M.D. *Parent's Magazine*, July, 1942.

"Health for the Backwoods." J. D. Ratcliff. *The New Republic*, June 8, 1942.

"One Disease Everybody Has." Gretta Palmer. *Cosmopolitan Magazine*, July, 1942.

"Varicose Veins." Maxine Davis. *Good Housekeeping Magazine*, July, 1942.

"If You Break a Bone." Louise Fox Connell. *You Magazine*, 1942 Summer Issue.

"Now Is the Time To Have Children." Paul Popenoe. *Ladies' Home Journal*, July, 1942.

"Vitamin Insurance." Forrest Williams. *You Magazine*, 1942 Summer Issue.

(The above is not presented as a complete list and the articles cited are not necessarily recommended.)

#### FILM NOTES

To our list of recommended films, we are happy to add the following with the suggestion that health agencies will find the first highly useful for professional education purposes and the second equally valuable for lay instruction.

(1) *Immunization Against Infectious Diseases*, produced by Lederle Laboratories, Inc., 30 Rockefeller Plaza, New York, N. Y. Length, three reels. Silent, 16 mm. version. Available to health departments without cost.

This is a remarkable film in that it contains color shots of actual cases of the more important acute communicable diseases—including such relatively rare ones as rabies and smallpox. The photography is of high quality and the content of the film is thoroughly accurate, as evidenced by the fact that the picture bears the approval of the American Academy of Pediatrics. The film, in addition to the case material presented, contains data relative to the geographical distribution of the diseases, methods of immunization, the number of doses and the amount of the

injections administered, and other factual material. The film was made by Drs. Charles F. McKhann and Harry A. Towsley of the University of Michigan Medical School. The picture is not suitable for lay groups, but it may be shown to advantage at staff meetings or other gatherings of health personnel. It would be especially valuable for showing to public health nurses or before groups of health workers taking "refresher" courses. This picture is scheduled for exhibition at the American Public Health Association convention in St. Louis in October. By all means see it.

(2) *The Modest Miracle*, produced by Standard Brands. Available in two versions: one running approximately 20 minutes and prepared for showing to community groups and the like, and one running 10 minutes and designed for theatrical use. Both 16 and 35 mm. prints, in sound, are offered. No rental fee. Consult Standard Brands, 595 Madison Ave., New York, N. Y., concerning bookings.

From the standpoint of entertainment, *The Modest Miracle* is excellent. The scenario is developed around the story of the 25 years of work leading up to the synthesis of vitamin B<sub>1</sub>—as thrilling a story as can be found in the annals of nutrition research. The work of such investigators as Eijkman, Funk, and Williams is dramatically described in a series of well staged episodes. The cast is made up of actors of considerable ability, the sets are realistic, and the photography and sound are of high quality. There are only two aspects of this picture that one might criticize: it perhaps overemphasizes the importance of enriched bread in the diet, and the dedication is a bit "stuffy." Otherwise this is a top-notch production.

## BOOKS AND REPORTS

**The Modern Treatment of Syphilis**—By *Joseph Earle Moore, M.D.* (2nd ed.) Springfield, Ill.: Thomas, 1941. 674 pp. Price, \$7.00.

Those who are familiar with Moore's first edition will welcome the augmented data and discussion of the second, while others will appreciate this comprehensive monograph not only as a valuable compilation of the literature but as an indispensable source.

Dr. Moore needs no introduction to syphilologists, but for the sake of others it should be said that he is Physician-in-charge of the Syphilis Division of Johns Hopkins Hospital, an outstanding member of the Clinical Coöperative Group and for many years one of the leaders of the medical profession in matters pertaining to syphilis.

His first edition has been a most valuable text of diagnosis as well as treatment from the viewpoint of the internist. Without impairment of the clear and logical style of the original, the second edition adds much new material. Included among this are sections on infectiousness, the use of Mapharsen, the oral bismuth therapy, the results of treatment, primary optic atrophy, the diagnosis of congenital infection, the interpretation of serologic tests, the public health aspects of syphilis and intensive arsenotherapy. The latter is of particular interest at a time when little but approbation of the method is to be heard. Not the least valuable of the features of this text is an excellent index.

As Dr. Moore says, the venereal disease control officer "should combine in himself public health experience and a wide clinical knowledge of syphilis" since the only available approach to the problem of control is through case find-

ing and therapy. Careful study of this text will prove a valuable adjunct to the experience of the expert as well as instructive to the inexperienced.

W. A. BRUMFIELD, JR.

**Modern Medicine. Its Progress and Opportunities**—By *Netta Wilson and S. A. Weisman, M.D.* New York: George W. Stewart, 1942. 218 pp. Price, \$2.00.

This book should stimulate the interest of senior high school or junior college students in medicine and its allied subjects. Its fifteen chapters outline landmarks in bacteriology, parasitology, physiology, cardiology, surgery, endocrinology, nutrition, anesthesia and other phases of modern medicine. Each subject is dramatically introduced by a historical or other interest-arresting anecdote and then developed simply, vividly, and, in the main, accurately up to its 1942 status. The chapter closes with a description of the respective career opportunities and the studies which will fit the candidate for such work.

Not all of the anecdotes seem to the reviewer to be in good taste. "Great Fleas Have Little Fleas" (animal parasites) begins with the gruesome account of a college initiation where two trichinosis deaths occurred after the neophytes had to eat "human flesh" (raw pork). The concluding sentence states, "This parasite . . . is today inflicting an incurable disease on from 10 to 25 million Americans." *Trichinella* may be infesting millions but not causing "incurable disease," a statement which, as a sequel to its preceding story seems especially unfortunate.

The very commendable and generally successful attempts to simplify termi-

nology and interpret science result in other inaccuracies.

As the book is evidently designed to recruit "medics" and their kin, even quotation marks cannot excuse the use of "ptomaine poisoning." Also, referring to diphtheria vaccine will harass future bacteriology and public health instruction. So will the statement (page 2) that ". . . germs are weakened every time they pass through a body that has good resistance to them. A germ that has passed through a highly resistant body is like a wounded soldier who cannot put up much of a fight." Another oversight (page 186) is omission of proteins from the necessary "chemical ingredients" foods.

Erroneous impressions are also given regarding some health department activities. Page 24 states that ". . . all persons who handle food in public places have to pass a medical examination. . . ." The same sort of health department must be envisaged on page 197, ". . . every public-health department sends out tons of educational material." Unfortunately, too many people gauge public health success by the volume of futile food handler examinations and even some health departments evaluate their program of public health education on a "tonnage" basis.

In the broad field covered by this book, inaccuracies are inevitable. Despite these criticisms, it should be very useful in high school and junior college libraries for reference and even assigned reading. However, the school physician or school nurse should first edit it with appropriate marginal notations. A few words with the classroom teacher would also be helpful. CHARLES E. SMITH

**From Infancy Through Childhood**—By Louis W. Sauer, M.D., Ph.D. New York: Harper, 1942. 200 pp. Price, \$2.00.

Here is another concise, well arranged and practical handbook for

parents which answers the questions most frequently raised in the care of babies and young children. It includes up-to-date material on vitamins and balanced diets and on the various immunization procedures. It is hopeful to find in the middle of this helpful volume such an excellent chapter on Mental Health. No consideration of child health today can overlook the importance of proper habit training. Dr. Sauer recognizes the advantages of the Nursery School, but warns against certain inherent dangers such as exposure to the communicable diseases.

The chapters on the prematurely born infant and the adopted child are timely and well written. The value of this book has been enhanced by excellent photographic illustrations, an appendix covering accidents, definitions of terms, and a complete index. The usual tables and charts on heights and weights are included. The publishers are to be congratulated upon the printing and general make-up of the volume.

RICHARD A. BOLT

**Tuberculosis in Industry—Report of the Symposium Held at the Saranac Laboratory for the Study of Tuberculosis, Saranac Lake, N. Y., June 9-14, 1941.** New York: National Tuberculosis Association, 1942. 374 pp. Price, \$3.00.

The 1941 sessions of the Symposium were devoted exclusively to tuberculosis in industry. After brief statements by Dr. Leroy U. Gardner on sources of infection, pathology, diagnosis, and treatment of pulmonary tuberculosis, the connection between the occurrence of this disease and various occupations was discussed by members of the Symposium. Emphasis on industrial health and employer responsibility, enforced by compensation laws, has focused attention on occupation as a cause of disease. It is no longer popular to think first of overcrowding, poor housing.

dietary deficiencies, and physical or mental strain as accessory causes of a newly discovered case of tuberculosis. Some specific factor like an irritating gas or a hot or humid atmosphere in workshops now comes to mind as the most probable cause.

Reduction in the incidence of tuberculosis among the general population has been paralleled in industry. In 1911 tuberculosis of the respiratory system was the first cause of death among industrial wage earners insured by the Metropolitan Life Insurance Company, accounting for more than 20 per cent of the deaths. Today it is fifth in importance and accounts for  $6\frac{1}{2}$  per cent of the deaths among these workers. A study by the National Institute of Health of data from 49 mutual sick benefit associations showed a steady downward trend in deaths from tuberculosis from 1925 to 1939.

Members of the Symposium were in agreement on the following points: There can be no tuberculosis without tubercle bacilli; the opportunities for infection vary widely in different communities in different social strata in those communities; the prevalence of disease is not uniform; the source of infection is invariably another tuberculous individual; transmission of infection is usually in the immediate vicinity of the open carrier; most clinically significant tuberculosis is the result of reinfection although we recognize that sometimes primary tuberculosis may give rise to such disease.

The all-embracing environmental factor, designated as the "standard of living," was accepted as significant in the etiology of tuberculosis. It was concluded that of all the accessory environmental factors peculiar to industry only exposure to free silica is acceptable without challenge. Of the dusts, only those high in free  $\text{SiO}_2$  are known to alter appreciably susceptibility to tuberculosis.

It was concluded that the basis of control is education and prevention, and the essence of prevention is discovery of the case and its prompt treatment.

R. R. SAVERS

*The Doctors Mayo—By Helen Clapesattle. Introduction by Dr. Guy Stanton Ford. Minneapolis: University of Minnesota Press, 1941. 864 pp., 64 ill. Price, \$3.75.*

Contemporary or near-contemporary biography must of necessity be an *ex parte* statement. It cannot afford to indulge in detached weighing of evidence for or against the historical importance of its subject; nor is there the impulse to do so. It exists because a man—or, as in the present instance, a closely-knit group of men—has made sufficient impact on his time to be thought worthy of the record. The author must be, by definition of his purpose, an enthusiast. The one essential quality of such a biography, therefore, is success in portraying the color of the subject rather than his accomplishments.

The present work, in so far as it represents biography, is curiously mixed when measured by this standard. The first portion dealing largely with the older Dr. Mayo, is extraordinarily successful. Evidencing wide research, it presents an exciting picture of a pioneer civilization, in addition to a living portrait of a man. In the second portion, however, dealing with the sons, the authoress has allowed great accomplishments to mechanize the portrait. Somehow the Mayo brothers fail to emerge as the living characters they were. Possibly this is due in part to what appears to be an intent to steer away from the domestic scene wherein the color of men may often be most readily appreciated. If this course was for obvious reasons necessary, it is perhaps too bad that publication could not have been delayed until all the pigments could be employed.

One regrets a little the third portion of this volume, which consists of a too detailed description of the Mayo Clinic and Foundation, their origin, development, and organization, together with accounts of the more important medical contributions emanating therefrom, all told in a tone of somewhat fulsome praise.

EDWIN P. LEHMAN

Public Works Engineers' Yearbook 1942—*Chicago: American Public Works Association*, 1942. 387 pp. Price, \$3.50.

The 1942 edition of the *Public Works Engineers' Yearbook* presents an excellent overall picture of current problems in the public works field. The volume comprises the papers presented at the annual Public Works Congress which cover the major activities in this broad field of public endeavor, supplemented by timely material especially prepared by outstanding authorities. There is also included a report of the business proceedings of the association and its membership roster. The book's usefulness is increased by an index.

Organized under functional headings for ready reference, this edition of the *Yearbook* contains more than 30 authoritative articles on such subjects as:

Public Works Problems in Defense Areas  
Public Works in the Post Defense Period  
Highway Transportation in Wartime  
Operating Results in the Combined Disposal of Garbage and Sewage

Current Developments on Brick Pavements,  
Concrete Paving, and Asphalt Paving  
Factors Governing the Selection of the Type of Sewage Treatment

Recommended Practice for Street Lighting  
Impact of Defense Activities upon West Coast Paving Practices

Civilian Protection: Plans, Organization, and Facilities

The Army Construction Program and Municipal Cooperation

Progress in Airport Development

Review and Current Status of Road and Street Stabilization.

Current Trends in Sewage Disposal

Management of Public Works Equipment and Supplies

Effect of Wartime Conditions upon Public Works in England

It will be seen from the list of articles presented that emphasis has been placed on defense. In addition, there are included a bibliography on field engineering and a series of articles on public works practices in New Orleans.

Throughout the *Yearbook*, both the administrative and technical aspects of the problem are discussed. Governmental administrators, research bureaus, libraries, and others, as well as public works engineers and officials will find a wealth of information in this important reference volume.

C. P. STRAUB

Manual for Managers of Rural and Other Small School Lunch Rooms—*Cleveland: The Ohio Dietetic Association (1001 Huron Road)*, 1942. 226 pp.

This *Manual*, prepared and published by the Ohio Dietetic Association, is especially timely since federal government agencies and state and local nutrition committees are promoting the expansion of hot lunch programs in rural areas. This book recognizes that many who are thus put in charge of the lunch room have not had adequate training or experience in this work, and that they need concrete, practical guidance. The basic principals of child feeding that are illustrated are in accordance with up-to-date nutritional data. The progressive view of "education through the school lunch" is present all through the book. It recognizes the need to train children in proper health habits, as well as to provide balanced meals.

There is adequate background information given for each phase of the work so that the inexperienced worker, after reading it, will be in command of a good working knowledge of the problems involved. The suggested

forms for keeping records will orientate the novice and give valuable suggestions to the experienced. The recipes are set up clearly in a simplified form for quantities of 12, 25, and 50, which may easily be multiplied for greater amounts. All food workers should find the Tables of Weights, Measurements, and Symbols used in Recipes of great help, and the Tables of Some Common Food Measurements, and the Average Number of Servings Obtained from Common Staples, will be great time savers. The *Manual* is timely as well as efficient, and it should prove valuable to the individual managers of rural and other small lunch rooms, as well as expedite the expansion of the hot lunch program in these areas.

CONSTANCE C. HART

**Manual for Teaching Midwives—**  
*By Anita M. Jones, R.N. Bureau Publication No. 260, U. S. Department of Labor, Children's Bureau. Government Printing Office, Washington, 1941. For sale by the Superintendent of Documents, Washington, D. C. Price, \$.30.*

Recently published by the Children's Bureau of the U. S. Department of Labor is this *Manual*. Its purpose is to present a well planned course of twenty classes, demonstrations, and practice periods for the instruction of midwives. Its object is to instruct the poorly trained and often uneducated midwife "to use aseptic technique; never to interfere with the delivery of the baby; and to call the doctor at the first sign of danger." The author, herself a nurse-midwife, obviously is well acquainted with the type of individual to whom this instruction should go.

Accordingly, the subject material has been simplified so far as possible and has been expressed in language suitable to the medically untrained. Of particular merit are many simple diagrams illustrating labor, delivery, etc., as it concerns the midwife, and also others

for the construction of materials necessary to her and her patient so that parturition may be conducted in as safe a manner as possible.

The manual is to be recommended freely to the health departments of those states in which many deliveries must still of necessity be accomplished by midwives rather than physicians. It should also be required reading for the public health nurse in rural areas who is frequently called upon to assist the local doctor, or who, in case of emergency, may have to attend the patient herself.

C. H. PECKHAM

**A Primer on the Prevention of Deformity in Childhood—**  
*By Richard Beverly Raney, B.A., M.D. in collaboration with Alfred Rives Shands, Jr., B.A., M.D. Elyria, Ohio: National Society for Crippled Children of the United States of America, Inc., 1941. 188 pp. Price, \$1.00.*

This book, as its name implies, is concerned with the various deformities that may arise in childhood, their origin and prevention. It is designed not for orthopedic surgeons, but for the many people who are interested in crippled children and assist in their care—nurses, social workers, physicians who have had little training in this field, as well as lay-folk.

The style of the book is simple, readable, and leads to easy understanding. Eighty-seven well chosen drawings assist greatly in the presentation of the material. A glossary is appended to aid those who have difficulty with the more complicated medical terms.

The authors are to be congratulated on giving us a book which contains an amazing amount of information and yet is presented in such a fashion that those without any considerable knowledge of the subject may understand and appreciate it. This book is a valuable addition to any library.

WILLIAM T. GREEN



**Food Values in Shares and Weights**—By *Clara Mae Taylor*. New York: Macmillan, 1942. 92 pp. Price, \$1.50.

This little book is a timely help when everyone is showing a new interest in nutrition and trying to use the most adequate diet. It not only gives the approximate recognized nutrients needed, but also tells which foods will supply them.

The real feature of the book is in the fact that it gives a quick method of evaluating diets, which is set forth in tables that show the amounts of the nutritive essentials in both shares and weights. With the share system, which has been described in earlier nutrition publications by the late Dr. Mary Swartz Rose, it is possible to show very concretely the contribution of each food stuff that the various articles of food make. The book contains graphs which illustrate this for men and women of various degrees of activity and also for the child at different stages of its growth.

The tables have been worked out according to the new recommended daily allowances suggested and adopted by the Committee on Foods and Nutrition of the National Research Council in May, 1941.

The book will be valuable to teachers of nutrition and also offer a very definite help to public health nurses as well as to the housewife who wants to help herself. MARY AGNES DAVIS

**Biology for Better Living**—By *Ernest E. Bayles and R. Will Burnett*. New York: Silver Burdett, 1942. 754 pp. Price, \$2.28.

This biology for the secondary school reflects an increasing tendency to include material in the form of personal and public hygiene in a course designed to introduce the student to the nature of living things. One of the eight units in this book is devoted to Personal and

Social Health, with an allotment of one hundred pages. Other units deal with the nature of plants and the use of land, adaptation, the use of food in the body, plant and animal behavior, evolution, inheritance, and the conservation of biologic wealth.

The book is clearly and simply written, well illustrated, and attractive in format. C. E. TURNER

**Textbook of Clinical Parasitology**—By *David L. Belding, M.D.* New York: Appleton-Century, 1942. 890 pp. Price, \$8.50.

The present war has stimulated interest in the prevention, recognition, and treatment of parasitic diseases. It is, therefore, desirable now and in the post-war period to have available accurate knowledge of the clinical aspects and recent advances in the treatment of these diseases. This need is well met in this book. The essential medical aspects of protozoology, helminthology, and entomology are practically combined in a single volume. The material is clearly presented, and such matters as life cycles are enhanced by diagrammatic representation. On the whole, the text is profusely illustrated. In addition there are useful tables facilitating reference to geographic distribution, principal pathology, insect vectors, symptomatology and treatment of parasitic diseases. The technical supplement is quite complete and up to date.

Treatment is discussed in general under each disease but specific directions are found in a separate section toward the end of the book. To this reviewer it would seem to be more advantageous to have a complete chronological discussion with specific directions, dosage, etc., under each subject rather than to have to interrupt one's reading to refer to another section in the book. In the discussion of amebiasis, reference is not made to Dio-

doquin which apparently has a definite place in the therapy and possibly the prevention of that disease.

However, these are relatively minor points in a single volume which seems very useful for the practitioner, the student, the public health man, and the field worker.

HARRY MOST

**New Health and Growth Series—**  
By *W. W. Charters, Ph.D., Dean F. Smiley, M.D., and Ruth M. Strang, Ph.D.* New York: Macmillan, 1941.

Grade 1.	All Through the Day	178 pp.	Price \$ .72
" 2.	Through the Year	180 pp.	" .80
" 3.	Health Secrets	242 pp.	" .84
" 4.	Healthful Ways	246 pp.	" .84
" 5.	Let's Be Healthy	278 pp.	" .88
" 6.	Habits, Healthful and Safe	277 pp.	" .92
" 7.	Growing Up Healthy	277 pp.	" .92
" 8.	A Sound Body	310 pp.	" .96
" 9.	Health in a Power Age	333 pp.	" 1.20

This is a delayed review of one of the best of the sets of health readers to appear during the past year. The series is such a complete revision of the original that comparisons with the earlier set are pointless.

The readers, particularly for the first four grades, are outstanding for their simplicity of statement, their interesting stories of Bobby and Nancy and their friends, and the intriguing photographs which illustrate everything from lovely Nancy in the bathtub to pictures of foods from which the reader is asked to choose a good luncheon menu. Especially well done are the narratives pointing up desirable personality habits. The authors have refrained from moralizing, and delightful stories for teachers and pupils alike are the result.

The books for the upper grades introduce materials on both structural and functional aspects of major body organs and systems. Emphasis, how-

ever, is placed on the relation of this knowledge to activities of boys and girls of the various age levels.

As to the form: each book from first grade through ninth calls for participation by the child. There are things to do, problems to work on, and questions which test how accurately the reading has been done. Beginning with the third grade reader a glossary is included and diagrams are introduced to aid the photographs in illustrating the text. Reading references enlarge the scope of the readers for junior high school level.

The photographs in this series, however, are the striking feature. Not only do they represent modern photography at its best in illustrating the text, but they are used consistently as teaching devices. Photographs offer puzzles to solve; games to play; tests of whether what is read is understood. These are new and delightful uses of pictures. The pictures, moreover, illustrate health without a word of text. This is the effect of page after page of pictures of fine healthy children having fun with life.

Of special note is the adequate treatment given the subject of nutrition on every grade level. Nutrition has been related to life activities and the growth and development of the body. Facts about foods appear in pictures and words in the first four grades; reports of experiments and tables of food values appear in the next four grades, with the story of digestion and its relation to eating habits presented in Grade 8, and the public health aspects of nutrition coming in Grade 9. It is a splendid sequence of sufficient interest even to a slightly fatigued campaigner in the present national nutrition program.

DOROTHY B. NYSWANDER

## BOOKS RECEIVED

- PREVENTIVE MEDICINE IN MODERN PRACTICE.** Edited by Committee on Public Health Relations of The New York Academy of Medicine. New York: Hoeber, 1942. 851 pp. Price, \$10.00.
- FIRST AID PRIMER.** By Hermann Leslie Wenger and Eleanor Sense. New York: Barrows, 1942. 104 pp. Price, \$1.00.
- THE MODERN ATTACK ON TUBERCULOSIS.** By Henry D. Chadwick and Alton S. Pope. New York: Commonwealth, 1942. 95 pp. Price, \$1.00.
- HEALTH EDUCATION OF THE PUBLIC.** By W. W. Bauer and Thomas G. Hull. 2d ed. Philadelphia: Saunders, 1942. 315 pp. Price, \$2.75.
- HEREDITY, FOOD, AND ENVIRONMENT IN THE NUTRITION OF INFANTS AND CHILDREN.** By George Dow Scott. Boston: Chapman & Grimes, 1942. 778 pp. Price, \$5.00.
- AMERICA'S NUTRITION PRIMER.** By Eleanor Sense. 4th ed. New York: Barrows, 1941. 95 pp. Price, \$1.00.
- THE PUBLIC HEALTH NURSING CURRICULUM GUIDE.** Prepared by Joint Committee of the National Organization for Public Health Nursing and the United States Public Health Service. New York: National Organization for Public Health Nursing, 1942. 206 pp. Price, \$2.00.
- A COOK BOOK FOR NURSES.** By Sarah C. Hill. rev. ed. New York: Barrows, 1937. 74 pp. Price, \$1.25.
- PEOPLE ARE IMPORTANT.** By Floyd L. Ruch, Gordon N. Mackenzie, and Margaret McClean. Chicago: Scott, Foresman & Co., 1941. 283 pp. Price, \$1.32.
- SEX EDUCATION IN HIGH SCHOOLS.** By John Newton Baker. New York: Emerson, 1942. 155 pp. Price, \$2.00.
- THE DYNAMIC STATE OF BODY CONSTITUENTS.** By Rudolph Schoenheimer. Harvard University Monograph in Medicine and Public Health, Number 3. Cambridge: Harvard University Press, 1942. 78 pp. Price, \$1.75.
- ALCOHOL EXPLORED.** By H. W. Haggard and E. M. Jellinek. Garden City: Doubleday, Doran, 1942. 297 pp. Price, \$2.75.
- THE SCIENCE OF HEALTH.** By Florence L. Meredith. Philadelphia: Blakiston, 1942. 427 pp. Price, \$2.50.
- THE SANITARY INSPECTOR'S HANDBOOK.** By Henry H. Clay. 5th ed. London: Lewis, 1942. 534 pp. Price, \$5.25.
- FOOD 'N' FUN FOR THE INVALID.** By Florence La Ganke Harris and Dorothy A. Ridler. New York: Barrows, 1942. 255 pp. Price, \$2.00.
- GET MORE OUT OF LIFE.** By Catherine Groves. New York: Association Press, 1941. 136 pp. Price, \$1.25.
- YOUTH LOOKS AT MARRIAGE.** By M'Ledge Moffett. New York: Association Press, 1941. 47 pp. Price, \$25.
- BLOOD GROUPING TECHNIC.** By Fritz Schiff and William C. Boyd. New York: Interscience Publishers, 1942. 248 pp. Price, \$5.00.
- WAR GASES.** By Morris B. Jacobs. New York: Interscience Publishers, 1942. 180 pp. Price, \$3.00.
- PRISONERS OF WAR.** By William E. S. Flory. Washington: American Council on Public Affairs, 1942. 179 pp. Price, Cloth Edition, \$3.25. Paper Edition, \$2.75.
- PROCEEDINGS OF THE EIGHTH AMERICAN SCIENTIFIC CONGRESS.** Vol. I, Organization, Activities, Resolutions, Delegations. Washington: Department of State. 1941. 539 pp.
- CHRONIC PULMONARY DISEASE IN SOUTH WALES COALMINERS.** 1—Medical Studies. London: H. M. Stationery Office, 1942. 222 pp. Price, \$3.00.
- WITH THIS RING.** By Ethel Miller Nash. New York: Association Press, 1942. 112 pp. Price, \$1.50.
- DR. BARD OF HYDE PARK.** By J. Brett Langstaff. New York: Dutton, 1942. 365 pp. Price, \$3.75.

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**New Index of Illness**—Lest you may have missed this inconspicuous item, your attention is called to the table that inaugurates a monthly report on admission rates to hospitals under the various Blue Cross plans.

ANON. Incidence of Hospitalization, April, 1942. *Pub. Health Rep.* 57, 22:842 (May 29), 1942.

**Care of Premies**—Successful premature nursing care as carried on in a Michigan maternity hospital is described. Survival rates prove that good care pays.

BARNES, A. C., and WILLSON, J. R. Care of the Newborn Premature Infant. *J.A.M.A.* 119, 7:545 (June 13), 1942.

**Barnyard Note**—From a wide application of neutralization tests, it appears that, in one western valley region where equine encephalitis occurs in annual epidemics, the domestic fowls serve as reservoirs for infection of mosquitoes. The proportion of susceptible horses that become infected is very high.

HAMMON, W. McD., *et al.* A Large-Scale Serum-Neutralization Survey of Certain Vertebrates as Part of an Epidemiological Study of Encephalitis of the Western Equine and St. Louis Types. *J. Immunol.* 43, 5:75 (May), 1942.

**Simple Senile Deterioration**—Are you interested in the problem of aging? Either from your own, or the standpoint of your wartime job? Then you'll find much quotable material here, such as "the earliest symptom of senility is an inability to find any good in the present state of affairs and a tendency to glorify the past." There is much scientific discussion, too, and an excellent bibliography.

KORENCHEVSKY, V. The War and the Problem of Aging. *J.A.M.A.* 119, 8:624 (June 20), 1942.

"Oh Wad Some Power the Giftie Gie Us" . . .—It is always a salutary experience to see ourselves as we are seen by other eyes. This British professor of preventive medicine tells his fellow medical officers what he saw of the American scheme of civilian defense. It is full of delightful comments, some typically British in their understatement, as for instance, "The leadership of the health officer in civil defense is not therefore regarded as a matter of course . . ." He is very charitable in his criticism of our floundering efforts to build a defense organization.

MACKINTOSH, J. M. Civil Defense in the United States. *Pub. Health.* 55, 9:163 (June), 1942.

**Still the Costliest Health Hazard**—Establishing clinics and padlocking houses of prostitution do not constitute an effective V. D. control plan. The social protection program of the Federal Security Agency looks to a liaison between police and welfare agencies, adequate detention facilities, vocational training of offenders and supervision of employment of girls.

McNURT, P. V. The Federal Fight Against Venereal Disease. *J. Social Hyg.* 28, 3:117 (Mar.), 1942.

"Down in the Cellar, by the Jail"—"Defiled health departments I have known" would be a good title for this incredible tale, incredible if one were not aware of the truthfulness and the probity of the narrator. Some practical solutions are proposed for this inexcusable state of affairs.

MOUNTIN, J. W. Housing of Health Departments. *Pub. Health Rep.* 57, 21:781 (May 22), 1942.

**Pattern for Safe Water Supplies—**Just which state agencies perform what sanitary control of water supplies and sewage disposal systems are tabulated in this report upon the sanitary services of the several state health departments.

MOUNTIN, J. W., and FLOOK, E. Distribution of Health Services in the Structure of the State Government. *Pub. Health Rep.* 57, 24:885 (June 12), 1942.

**V. D. Case Finding—**Here you may read all the details by which the epidemiology of the venereal diseases is carried on in one hospital clinic. Given a competent social service it is possible to obtain the names of extra-marital contacts of new cases and these may be induced to submit to examination and treatment. This story needs constant repetition; for as yet it is one of the sadly neglected fields in public health administration.

SWEENEY, A. Studies in the Epidemiology of Syphilis. *Ven. Dis. Inform.* 23, 4:137 (Apr.), 1942.

**Worker Fitness in the National Crisis—**Shortcomings of the industrial health situation are surveyed to present a disquieting picture of their inadequacies. A convincing case is made for the need of immediate strengthening of the industrial health services.

TRASKO, V. M., and BLOOMFIELD, J. J. An Analysis of Industrial Hygiene Activities in State and Local Health Departments, 1940-41. *Pub. Health Rep.* 57, 23:853 (June 5), 1942.

**"Digging for Mrs. Miller"—**How the English have organized first aid and emergency treatment is most graphically described by one who was there. Certainly every American health worker ought to be informed about what England has proved in the fire of its dreadful experience.

WILLIAMS, H. Air Raid Medical Administration in England. *J.A.M.A.* 119, 7:540 (June 13), 1942.

# ASSOCIATION NEWS

## SEVENTY-FIRST ANNUAL MEETING

ST. LOUIS, MO., OCTOBER 27-30, 1942

*Meeting Headquarters: Municipal Auditorium*

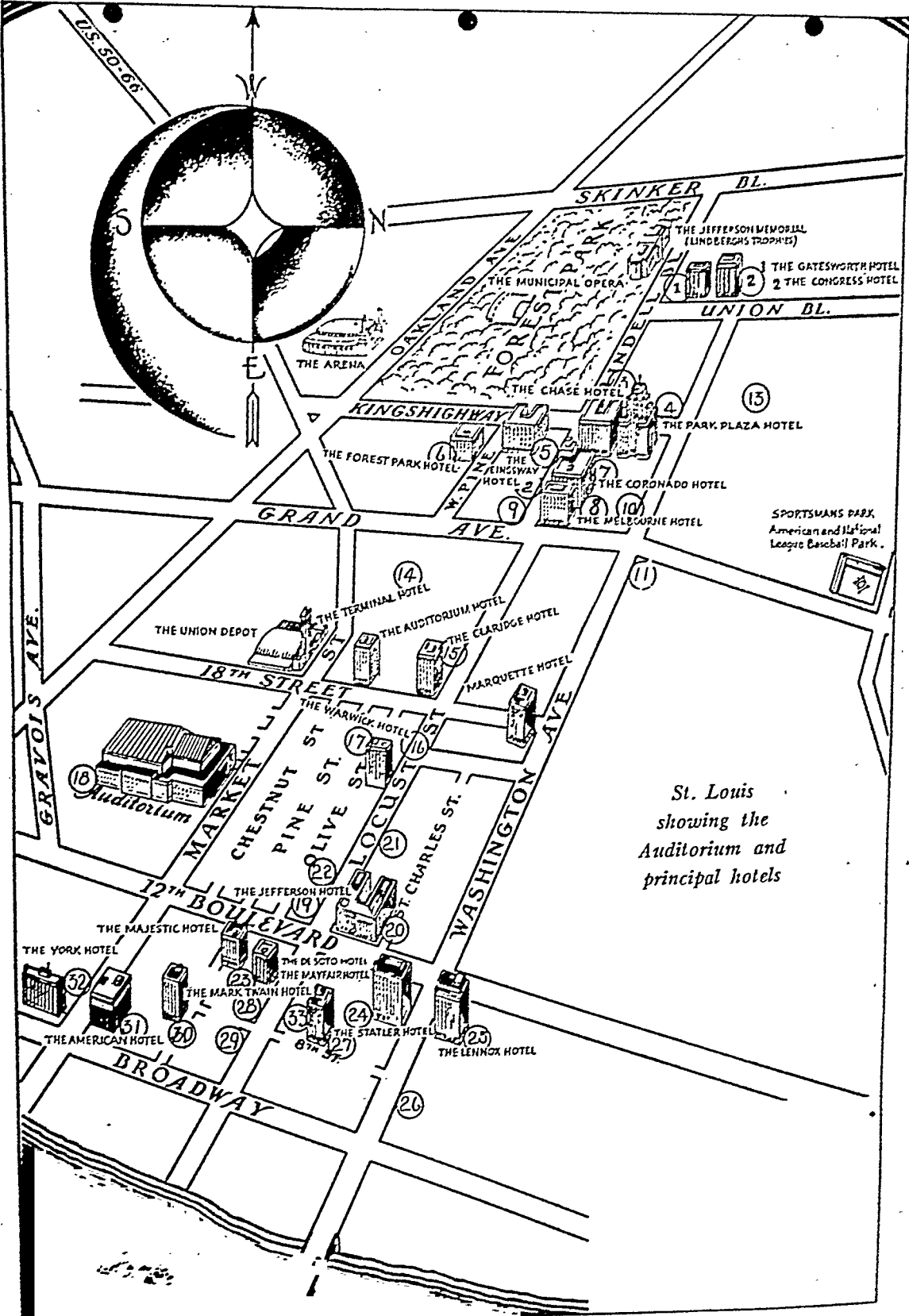
*Residence Headquarters: Hotels Jefferson and Statler*

### RAILROAD FARES FROM VARIOUS POINTS TO ST. LOUIS, MO.

#### *American Public Health Association*

*October 27-30, 1942*

<i>From</i>	<i>One-way for Pullman Travel</i>	<i>Round-trip for Pullman Travel</i>	<i>One-way Lower Berth</i>	<i>One-way Upper Berth</i>
Atlanta, Ga.	\$20.80	\$31.20	\$5.25	4.00
Baltimore, Md.	29.65	53.55	6.95	4.80
Boston, Mass.	40.10	72.20	9.25	6.40
Buffalo, N. Y.	23.70	43.80	5.80	4.40
Chicago, Ill.	9.65	14.45	2.95	2.20
Cleveland, Ohio	17.60	33.20	4.35	3.30
Dallas, Tex.	22.00	33.05	6.40	4.90
Denver, Colo.	30.05	45.10	7.90	5.95
Duluth, Minn.	23.95	35.95	6.40	4.90
Fort Worth, Tex.	22.45	33.65	6.40	4.90
Indianapolis, Ind.	8.20	16.05	2.95	2.00
Jacksonville, Fla.	31.10	46.65	8.10	6.20
Kansas City, Mo.	9.20	13.80	2.95	2.20
Louisville, Ky.	9.40	14.10	2.95	2.00
Los Angeles, Calif.	67.10	94.15	17.35	13.20
Memphis, Tenn.	10.25	15.40	2.95	2.20
Milwaukee, Wis.	12.45	18.65	3.50	2.65
Minneapolis, Minn.	19.30	28.95	4.35	3.30
Nashville, Tenn.	11.20	16.80	2.95	2.20
New Orleans, La.	25.60	38.45	6.80	5.15
New York, N. Y.	34.85	62.80	8.45	5.80
Omaha, Nebr.	13.85	20.80	3.50	2.65
Philadelphia, Pa.	31.90	57.40	7.85	5.40
Pittsburgh, Pa.	20.40	38.10	4.95	3.45
Portland, Ore.	72.10	94.15	17.35	13.20
Salt Lake City, Utah	46.30	64.70	11.90	9.05
San Francisco, Calif.	67.10	94.15	17.35	13.20
Seattle, Wash.	72.95	94.15	17.35	13.20
Washington, D. C.	29.65	53.55	6.95	4.80
Montreal, Que.	37.55	67.05	9.25	6.40
Halifax, N. S.	65.20	91.60	17.35	13.20
Ottawa, Ont.	34.25	61.60	8.45	5.80
Quebec, P. Q.	43.80	78.20	9.25	6.40
Toronto, Ont.	24.90	44.30	5.80	4.40
Vancouver, B. C.	72.95	94.15	17.35	13.20



St. Louis  
showing the  
Auditorium and  
principal hotels

American Hotel .....	31	Gatesworth Hotel .....	1	St. Louis University.....	9
Bishop Tuttle Memorial .....	19	Jefferson Hotel .....	20	Scruggs-Vandervoort-Barney....	28
Board of Education.....	33	Kingsway Hotel .....	5	Sheldon Memorial .....	10
Chase Hotel .....	3	Lennox Hotel .....	25	Statler Hotel .....	24
Claridge Hotel .....	15	Mark Twain Hotel.....	30	Stix, Baer & Fuller.....	26
Congress Hotel .....	2	Mayfair Hotel .....	27	Third Baptist Church.....	11
Coronado Hotel .....	7	Melbourne Hotel .....	8	Vashon High School (Negro)...	14
DeSoto Hotel .....	23	Municipal Auditorium .....	18	Warwick Hotel .....	17
Elks Club .....	12	Park Plaza Hotel.....	4	Y.M.C.A. ....	16
Famous-Barr .....	29	Public Library .....	22	York Hotel .....	32
Forest Park Hotel.....	6	Roosevelt Hotel .....	13	Y.W.C.A. ....	21

## RATES QUOTED BY ST. LOUIS HOTELS

*Seventy-First Annual Meeting, October 27 to 30, 1942*

## AMERICAN PUBLIC HEALTH ASSOCIATION

ALL RATES QUOTED ARE FOR ROOMS WITH BATH  
ON EUROPEAN PLAN

<i>Hotel</i>	<i>Single</i>	<i>Double</i>	<i>Suites</i>
New Hotel Jefferson	\$3.00-5.00-6.00-7.00	\$6.00-7.00-7.50-8.00	\$12.00-20.00
Statler	3.00-3.50-3.75-4.00 4.25-4.75-5.00	5.25-6.00-6.25-6.50 6.75-7.00-9.00	17.00-18.00
American	2.00-2.50	3.50-4.00	
Claridge	2.50-3.00	3.50-7.00	
Coronado	2.25 (shower) 2.75	4.50-5.00	6.00
DeSoto	2.65-up	4.00-5.00	8.00
Lennox	3.50-4.00-4.50-5.00 6.00	4.50-5.00-6.00-7.00 8.00	10.50-14.50
Mark Twain	2.50-4.00	3.50-5.00-5.50	
Maryland	2.25-2.50-2.75	3.25-3.50-3.75-4.00 4.50	
(without bath)	1.75-2.00	2.75-3.00	
Mayfair	3.00-3.50-4.00-5.00	4.00-4.50-5.50-6.00 7.00	
Melbourne	2.65-3.20-3.70-4.20	4.20-4.80-5.30-5.80 6.20	
Park Plaza	4.50	6.00-8.00	12.00-18.00
Warwick	2.00-2.50-3.00	3.00-3.50-4.00-4.50 5.00	7.00-10.00

.....(Cut off on this line and mail to the hotel of your choice).....

HOTEL RESERVATION BLANK FOR THE ST. LOUIS MEETING  
AMERICAN PUBLIC HEALTH ASSOCIATION, OCTOBER 27-30, 1942To .....  
(Name of Hotel)Please reserve for me ..... rooms for ..... persons  
for the A.P.H.A. Meeting.

Single room ..... Double room .....

Maximum rate per day for room \$. ..... Minimum rate per day for room \$. .....

I expect to arrive ..... If date of arrival is changed I will notify  
you at least 24 hours in advance.

Please acknowledge this reservation.

Name .....

Street Address.....

City..... State.....



# Preliminary Program of the Scientific Sessions of the 71st Annual Meeting of the American Public Health Association, and Meetings of Related Organizations, and of the Ninth Institute on Public Health Education

St. Louis, Mo.

October 24-30, 1942

THE Annual Meeting Program Committee offers a preview of the content of scientific sessions planned in connection with the 71st Annual Meeting in St. Louis, Mo. In many instances, sessions are complete. In others, places are purposely left open for important matters which may develop before October. Inaccuracies and omissions are to be expected and it is hoped they will be excused. The professional affiliations and addresses of speakers are not given, but a complete index to participants will be published in the final program which will be distributed to all delegates at the Registration Desk, Auditorium. Registration headquarters will be opened at 9:30 A.M. on Sunday, October 25.

## THE NINTH INSTITUTE ON PUBLIC HEALTH EDUCATION

(Under the auspices of the Public Health Education Section of the American Public Health Association)

### SATURDAY, SUNDAY, MONDAY, AND TUESDAY, A.M.

#### Saturday

6:30 P.M. *Dinner Meeting for Leaders and Committee—Crystal Room, Hotel New Jefferson.*

Leadership for Community Service.

#### Sunday

9:30 A.M. *First General Session—Assembly Room 1, Auditorium.*

Educational Qualifications for Health Educators. WILLIAM P. SHEPARD, M.D.

Objectives of Ninth Institute on Public Health Education. CLAIR E. TURNER, DR.P.H.

## INSTITUTE ON PUBLIC HEALTH EDUCATION (Cont.)

## Sunday

10:30 A.M. and 2:00 P.M.

## Community Organization for Health Education

*Assembly Room 1, Auditorium.*

1. Larger Urban Area. WILTON L. HALVERSON, M.D., Leader.

*Panel:*

MARY P. CONNOLLY  
LYNDE G. GATELY, M.D.  
BLEECKER MARQUETTE  
PHILIP L. RILEY

*Committee Room 3A, Auditorium.*

2. Smaller Urban Area. IRA V. HISCOCK, Sc.D., Leader.

*Panel:*

SARAH S. DEITRICK, M.D.  
JOSEPH H. HOWARD, M.D.  
MARION MCKINNEY  
CHARLES C. WILSON, M.D.

*Committee Room 3B, Auditorium.*

3. Urban-Rural Area. HAROLD H. WALKER, Ph.D.

*Panel:*

Participants to be announced.

*Committee Room 3D, Auditorium.*

4. Rural Area. LUCY S. MORGAN, Ph.D., Leader.

*Panel:*

E. G. MCGAVRAN, M.D.  
Other participants to be announced.

## Monday

9:30 A.M. *Group Discussions with Leaders—Auditorium.*

*Committee Room 3A, Auditorium.*

1. Public Relations. W. FORD HIGBY, Leader.

*Assembly Room 1, Auditorium.*

2. School and Health Department Relationships. MAYHEW DERRY-BERRY, Ph.D., Leader.

Periods for consultation with experts on local problems will also be arranged.

2:30 P. M. *Second General Session—Assembly Room 1, Auditorium.*

National War Programs and Their Objectives. MILTON ROSE, M.D., Leader.

3:30 P.M. *Conducted Tours of the Exhibits under the auspices of the Committee on Scientific Exhibits—HOMER N. CALVER, Chairman.*

## INSTITUTE ON PUBLIC HEALTH EDUCATION (Cont.)

Tuesday

*9:30 A.M. Third General Session—Opera House, Auditorium.*

Highlights of the Institute.

Five Minute Summaries by Panel Leaders.

*10:30 A.M.*

Address: Health Education in a Democracy. C.-E. A. WINSLOW, DR.P.H.

Throughout the Institute, Educational Publicity Consulting Service in Health Education and Demonstrations of Source Material will be conducted under the auspices of the Social Work Publicity Council, Mrs. SALLIE EVERSON BRIGHT, Executive Secretary, at Consultation Headquarters in the Auditorium.

NOTE: A final program of the Institute may be obtained from the Association office, 1790 Broadway, New York, N. Y. The registration fee is \$3.00 for members of the American Public Health Association; and \$6.00 for all others. Registration will be closed at the discretion of the Chairman, Benjamin G. Horning, M.D., and early enrollment is accordingly recommended.

## OTHER SATURDAY, SUNDAY, AND MONDAY MEETINGS

## AMERICAN SCHOOL HEALTH ASSOCIATION

*Monday, 2:30 P.M. First General Session—Assembly Room 4, Auditorium.**Presiding: EARL E. KLEINSCHMIDT, M.D., President.*

## ROUND TABLE ON HEARING IMPAIRMENT PROBLEMS

Scope of the Problem. CONRAD G. SELVIG.

State-wide Attack on the Problem. EMILY A. PRATT, M.D.

Discovery of Hearing Loss. CHARLES E. KINNEY, M.D.

Medical Follow-up of Hearing Impairments. HORACE NEWHART, M.D.

Development of a Program for Hard-of-Hearing Children in a City School System. Speaker to be announced.

*Monday, 6:30 P.M. Dinner Session—Adam Room, Hotel Statler.**Presiding: EARL E. KLEINSCHMIDT, M.D., President.*

Address of Welcome. JOSEPH F. BREDECK, M.D.

## EDUCATING FOR HEALTH

What the Superintendent Should Expect from the School Health Services. JOHN L. BRACKEN.

Administrative Procedures in the Implementation of the 1942 Year-book of the American Association of School Administrators. WILLIAM J. HAMILTON.

## AMERICAN SOCIAL HYGIENE ASSOCIATION

Sunday, 8:30 P.M. *Ivory Room, Hotel New Jefferson.*

CONFERENCE OF MUNICIPAL PUBLIC HEALTH  
ENGINEERS

Monday, 9:30 A.M. *Committee Room C, Auditorium.*

## Committee Reports.

Water Supply

Housing

Malaria Control

Monday, 12:30 P.M. *Luncheon Session—Room 1, Hotel New Jefferson.*  
*Business Session.*

CONFERENCE OF MUNICIPAL PUBLIC HEALTH ENGI-  
NEERS AND CONFERENCE OF STATE  
SANITARY ENGINEERS

Monday, 2:30 P.M. *Committee Room C, Auditorium.*

*Presiding: C.-E. A. WINSLOW, DR.P.H.*

TOOLS FOR THE ENGINEER IN DEALING WITH THE  
HOUSING PROBLEM

The Legal Control of Substandard Housing. C.-E. A. WINSLOW, DR.P.H.

The Appraisal of Substandard Housing. ALLAN A. TWICHELL.

The Opportunity for the Engineer. ABEL WOLMAN, DR.ENG., and ALFRED  
H. FLETCHER.

*Discussion.*

The Sanitary Engineer in Civilian Defense. RALPH E. TARBETT, C.E.

Discussion of A. S. C. E. Committee Report on the Sanitary Engineer.  
F. C. DUGAN, C.E.

CONFERENCE OF STATE AND PROVINCIAL PUBLIC  
HEALTH LABORATORY DIRECTORS

Monday, 9:30 A.M. and 2:30 P.M. *Assembly Room 3, Auditorium.*

Monday, 12:30 P. M. *Luncheon Session—Ivory Room, Hotel New Jefferson.*

CONFERENCE OF STATE DIRECTORS OF HEALTH  
EDUCATION

Monday, 9:30 A.M. and 2:30 P.M. *Room 3, Hotel New Jefferson.*

CONFERENCE OF STATE DIRECTORS OF PUBLIC  
HEALTH NURSING

Monday, 9:30 A.M. and 2:30 P.M. *Room 7, Hotel New Jefferson.*

## CONFERENCE OF STATE SANITARY ENGINEERS

Sunday, 2:00 P.M. and 8:00 P.M. Room 7, Hotel New Jefferson.

Monday, 9:00 A.M. Committee Room A, Auditorium.

Monday, 8:00 P.M. Room 1, Hotel New Jefferson.

## EYE HEALTH CONFERENCE

Saturday, 9:30 A.M. and 2:30 P.M. Room 9, Hotel New Jefferson.

Sunday, 9:30 A.M. and 2:30 P.M. Room 9, Hotel New Jefferson.

Limited to 60 public health nurses, physicians, and health educators. Applications should be addressed to ELEANOR W. MUMFORD, R.N., Associate for Nursing, National Society for the Prevention of Blindness, 1790 Broadway, New York, N. Y.

## ILLINOIS CONFERENCE ON PUBLIC HEALTH AND ILLINOIS PUBLIC HEALTH ASSOCIATION

*Joint Session—Assembly Room 4, Auditorium*

Monday, 2:30 P.M.

Address. ROLAND R. CROSS, M.D.

Address. HENRY F. VAUGHAN, DR.P.H.

Address. HUNTINGTON WILLIAMS, M.D.

## ILLINOIS PUBLIC HEALTH ASSOCIATION

*Dinner Session—Hotel New Jefferson*

Monday, 6:30 P.M.

## INTERNATIONAL SOCIETY OF MEDICAL HEALTH OFFICERS

Sunday, 2:30 P.M. Crystal Room, Hotel New Jefferson.

Sunday, 6:30 P.M. Dinner Session—Crystal Room, Hotel New Jefferson.

Monday, 9:30 A.M. Assembly Room 2, Auditorium.

Monday, 2:00 P.M. Assembly Room 2, Auditorium.

## SYMPOSIUM ON OCCUPATIONAL DISEASES

(Sponsored by the Industrial Hygiene Section)

Sickness Proneness Among Industrial Workers. W. M. GAFNER, D.Sc.

Discussion: H. C. HOUSTON.

Other speakers to be announced.

## TEACHERS OF PREVENTIVE MEDICINE IN MEDICAL SCHOOLS

Monday, 9:30 A.M. Committee Room 3C, Auditorium.

SESSIONS FROM TUESDAY, OCTOBER 27, TO FRIDAY,  
OCTOBER 30, INCLUSIVE

TUESDAY, 8:00 A.M.

CLEVELAND HEALTH MUSEUM

*Breakfast Session—Room 4, Hotel New Jefferson*

TUESDAY, 9:30 A.M.

EPIDEMIOLOGY

*First Session—Committee Room C, Auditorium*

*Presiding: ALTON S. POPE, M.D., Chairman.*

SYMPOSIUM ON SYPHILIS

Present Status of Venereal Disease Control in the Army. LIEUTENANT COLONEL THOMAS B. TURNER, M.C., and MAJOR WILLIAM A. BRUMFIELD, JR., M.C.

Prostitution in the Spread of Venereal Diseases in an Army Cantonment Area. BASCOM JOHNSON, JR., M.D.

The Epidemiology of Syphilis in Baltimore. RALPH F. SIKES, M.D.

Problems in the Epidemiology of Venereal Disease in War Time. THEODORE ROSENTHAL, M.D.

The Course of the Serologic Tests during Therapeutic Malaria in Patients with Syphilis. BERNARD I. KAPLAN, M.D., and I. JAY BRIGHTMAN, M.D.

INDUSTRIAL HYGIENE

*First Session—Committee Room 3B, Auditorium*

*Presiding: WILLIAM P. YANT, Chairman.*

Address of the Chairman. WILLIAM P. YANT.

SYMPOSIUM ON INDUSTRIAL HYGIENE AND WAR

The Industrial Hygiene Program of the Army Medical Corps. LIEUTENANT COLONEL A. J. LANZA, M.C.

The Program of the United States Navy. CAPTAIN C. S. STEPHENSON, U.S.N.

The Program of the United States Public Health Service. JAMES G. TOWNSEND, M.D.

Unexpected Occupational Disease Exposures During Wartime. JOHN J. PRENDERGAST, M.D.

TUESDAY, 9:30 A.M.

## LABORATORY

*First Session—Assembly Room 3, Auditorium**Presiding:* JAMES GIBBARD, *Chairman.**Section Business.*Report of the Coördinating Committee on Standard Methods.  
*Chairman,* LIEUTENANT COLONEL A. PARKER HITCHENS, M. C.Report of the Standard Methods Committee on Diagnostic Procedures  
and Reagents. *Chairman,* WILLIAM D. STOVALL, M.D.Report of the Standard Methods Committee on Biology of the Labora-  
tory Animal. *Chairman,* COLONEL RAYMOND A. KELSER.Report of the Standard Methods Committee on Biological Products.  
*Chairman,* LIEUTENANT COLONEL ELLIOTT S. ROBINSON, M.C.Report of the Laboratory Section Representative on the Commission  
for the Study of Biological Stains. WILLIAM D. STOVALL, M.D.

Report of the Section Archivist. AUGUSTUS B. WADSWORTH, M.D.

Contributions of the Medical Corps of the Army to the Public Health  
Laboratory. COLONEL EDGAR ERSKINE HUME, M.C.Food Handlers in the Army and Their Relationship to Salmonella Food  
Poisoning Outbreaks. LIEUTENANT COLONEL WILLIAM S. STONE, M.C.Salmonella Typing in a Public Health Laboratory. EARLE K. BOR-  
MAN, KENNETH M. WHEELER, PH.D., EVELYN D. WEST, and FRIEND LEE  
MICKLE, Sc.D.An Outbreak of Typhoid Fever Due to the Small Colony Variety of  
*Eberthella Typhosa*. JANIE F. MORRIS.ENGINEERING SECTION, CONFERENCE OF STATE SANI-  
TARY ENGINEERS, AND CONFERENCE OF  
MUNICIPAL PUBLIC HEALTH  
ENGINEERS*Joint Session—Assembly Room 2, Auditorium**Presiding:* J. LLOYD BARRON, C.E., HOWARD D. SCHMIDT, and SOL PENCUS, C.E.Report of the Committee on Water Supply. *Chairman,* ANSELMO F.  
DAPPERT.Report of the Committee on Sewage Disposal. *Chairman,* LANGDON  
PEARSE.Report of the Committee on Disinfection of Dishes and Utensils.  
*Chairman,* WALTER D. TIEDEMAN, M.C.E.Report of the Committee on Plumbing. *Chairman,* JOEL I. CONNOLLY.Public Health Problems Concerned in the Disposal of Garbage by  
Feeding It to Swine. WILLARD H. WRIGHT, PH.D.

TUESDAY, 9:30 A.M.

### HEALTH OFFICERS

*First Session—Assembly Room 1, Auditorium*

*Presiding:* E. R. COFFEY, M.D., *Chairman.*

DEBATE: IS THE COUNTY THE EFFECTIVE ADMINISTRATIVE UNIT  
FOR FULL-TIME HEALTH SERVICES IN RURAL AREAS?

*Referee:* HARRY S. MUSTARD, M.D.

*Team Captains:* *Negative*—WALTER L. BIERRING, M.D.  
*Affirmative*—To be announced.

*Team Members to be announced.*

*Judges:* *The audience.*

### FOOD AND NUTRITION

*First Session—Assembly Room 4, Auditorium*

*Presiding:* HENRY T. SCOTT, PH.D., *Chairman.*

#### NUTRITION RESEARCH

Relation of Soil Depletion to Food Values. OUIDA DAVIS ABBOTT, PH.D.

The Physical Structure of Bone as Revealed by X-ray Diffraction  
Technic. C. I. REED, PH.D., and B. P. REED, PH.D.

Recognition of Vitamin Deficiencies in Human Beings. VICTOR E. LE-  
VINE, M.D.

Allergy as a Problem of Public Health. FRENCH K. HANSEL, M.D.

Present Problem of Cereal Fortification. R. C. SHERWOOD, PH.D.

### VITAL STATISTICS SECTION AND AMERICAN ASSOCIA- TION OF REGISTRATION EXECUTIVES

*Joint Session—Committee Room 3A, Auditorium*

*Presiding:* R. N. WHITFIELD, M.D., and J. T. MARSHALL.

#### WAR PROBLEMS IN REGISTRATION

Round table:

Review of the Vital Statistics Report. W. THURBER FALES, SC.D.

Committee on Vital Records. LOWELL J. REED, PH.D.  
Other speakers to be announced.



TUESDAY, 12:30 P.M.

MATERNAL AND CHILD HEALTH

*Luncheon Session—Crystal Room, Hotel New Jefferson*

TUESDAY, 2:30 P.M.

HEALTH OFFICERS, LABORATORY, AND  
EPIDEMIOLOGY SECTIONS

*Joint Session—Opera House, Auditorium*

*Presiding:* E. R. COFFEY, M.D., JAMES GIBBARD, and ALTON S. POPE, M.D.

IMMUNIZATION

Tetanus Toxoid, Its Use in the United States Army. MAJOR ARTHUR P. LONG, M.C.

Tetanus Toxoid and Its Use for Active Immunization. DONALD T. FRASER, M.B., D.P.H., HELEN C. PLUMMER, PH.D., and M. D. ORR.

Immunization Against Typhus Fever. HERALD R. COX, SC.D.

Typhoid Vaccine Studies VII: Typhoid-Paratyphoid Vaccine. LIEUTENANT COLONEL DON LONGFELLOW, M.C., and CAPTAIN GEORGE F. LUIPPOLD, SN.C.

Vaccination Against Encephalitis. FREDERICK W. JACKSON, M.D.

PUBLIC HEALTH EDUCATION

*First Session—Assembly Room 3, Auditorium*

*Presiding:* SALLY LUCAS JEAN, *Chairman.*

*Section Business.*

Report of the Nominating Committee.

EDUCATIONAL PREPARATION FOR HEALTH EDUCATION

The Recent Report of the Subcommittee on the Educational Qualifications of Health Educators of the Committee on Professional Education. *Chairman,* CLAIR E. TURNER, DR.P.H.

What Do Administrators Expect of Health Educational Personnel? Speaker to be announced.

Field Experience for Health Educational Personnel.

a. *Internships—Cleveland Health Museum.* BRUNO GEBHARD, M.D.

b. *Community Field Training—Wayne University.* MINNIE KRUEGER OED.

*Discussion.*

**TUESDAY, 2:30 P.M.**

**VITAL STATISTICS AND MATERNAL AND CHILD  
HEALTH SECTIONS**

*Joint Session—Assembly Room 4, Auditorium*

*Presiding: R. N. WHITFIELD, M.D., and CHARLES C. WILSON, M.D.*

**USE OF SPECIAL INFORMATION**

Reliability of the Supplementary Information on the Certificate.  
Speaker to be announced.

How Can Statistical Data Be Used in Planning Maternal and Child  
Health and Crippled Children's Programs? AMY HUNTER, M.D., and  
WILLIAM KEETTEL, M.D.

Uses Made of the Information, and Potential Uses. Speaker to be an-  
nounced.

**ENGINEERING**

*First Session—Assembly Room 1, Auditorium*

*Presiding: J. LLOYD BARRON, C.E., Chairman.*

Public Health Implications in City and Regional Planning. HARLAND  
BARTHOLOMEW.

Accomplishments in Smoke Control. RAYMOND R. TUCKER.

An Expanded Service in Industrial Hygiene through Coördinated  
Effort. KENNETH J. WULFERT.

Environmental Sanitation Activities in the 7th Corps Area. CAPTAIN  
HERBERT M. BOSCH.

**FOOD AND NUTRITION**

*Second Session—Assembly Room 2, Auditorium*

**MILK AND DAIRY PRODUCTS**

Comparative Nutritive Value of Vegetable Oils with Butter Fat.  
E. B. HART.

Technical Problems Involved in the Manufacture and Distribution of  
Homogenized Milk. P. H. TRACY.

Protein in the Diet of Man. ICIE MACY HOOBLER, PH.D.

Milk in the Diets of College Students. HUGHINA MCKAY.

Regulating Milk and Milk Products. (Report of the Committee on Milk  
and Dairy Products.) Chairman, J. A. KEENAN, PH.D.

TUESDAY, 2:30 P.M.

## PUBLIC HEALTH NURSING

*First Session—Committee Room C, Auditorium**Presiding: ALMA C. HAUPT, R.N., Chairman.**Section Business.**Reports of Section Committees.**Nurses in Civilian Defense. MARIAN G. RANDALL, R.N.**Community Nursing Service. HORTENSE HILBERT, R.N.*

TUESDAY, 8:30 P.M.

## FIRST GENERAL SESSION

*Opera House, Auditorium**Presiding: JOHN L. RICE, M.D., President, American Public Health Association.**Addresses of Welcome:**HONORABLE WILLIAM DEE BECKER, Mayor of St. Louis**HONORABLE HENRY S. CAULFIELD, Director of Public Welfare**HONORABLE JOSEPH F. BREDECK, M.D., Commissioner of Health**Presidential Address. ALLEN W. FREEMAN, M.D., President-elect, American Public Health Association.**Address. THE RIGHT HONORABLE MALCOLM MACDONALD.**Announcement of Sedgwick Memorial Medal Award.**Reception to the President and President-elect.*

WEDNESDAY, 8:00 A.M.

## AMERICAN SCHOOL HEALTH ASSOCIATION

*Breakfast Session—Adam Room, Hotel Statler**Presiding: HELEN AHRENS CARY, M.D.**Report of the Committee on Childhood Tuberculosis. Chairman, J. A. MYERS, M.D.*

## HARVARD UNIVERSITY ALUMNI

*Breakfast Session—Crystal Room, Hotel New Jefferson*

## UNIVERSITY OF MICHIGAN ALUMNI

*Breakfast Session—Ivory Room, Hotel New Jefferson*

## YALE UNIVERSITY ALUMNI

*Breakfast Session—Room 1, Hotel New Jefferson*

## WEDNESDAY, 9:30 A.M.

## HEALTH OFFICERS

*Second Session—Assembly Room 2, Auditorium*

## RESEARCH AND RECORDS

The Single Line Index as an Administrative Aid. V. A. VAN VOLKENBURGH, M.D.

Health Department Control of Substandard Housing: Reports of the Committee on the Hygiene of Housing.

A New Survey Procedure. ALLAN A. TWICHELL, *Technical Secretary*.

Principles of Legal Control. C.-E. A. WINSLOW, DR.P.H., *Chairman*

Field Observations of Tuberculosis Patients in the Rural Areas of Tennessee. R. S. GASS, M.D., ANN DILLON, and W. C. WILLIAMS, M.D.

## INDUSTRIAL HYGIENE

*Second Session—Committee Room C, Auditorium*SYMPOSIUM ON TRAINING OF INDUSTRIAL HYGIENE  
PERSONNEL

The Training of the Physician. CARL M. PETERSON, M.D.

*Discussion.*

The Training of the Hygienist. THEODORE F. HATCH.

*Discussion.*

Undergraduate Training. MILTON H. KRONENBERG, M.D.

*Discussion.*

## MATERNAL AND CHILD HEALTH

*First Session—Assembly Room 4, Auditorium*

*Presiding:* CHARLES C. WILSON, M.D., *Chairman.*

A PUBLIC PROGRAM OF OUTPATIENT SERVICES FOR CHILDREN  
WITH CEREBRAL PALSY

*Panel Leader:* WINTHROP PHELPS, M.D.

*Participants* to be announced.

WEDNESDAY, 9:30 A.M.

LABORATORY, ENGINEERING, AND EPIDEMIOLOGY  
SECTIONS*Joint Session—Assembly Room 1, Auditorium**Presiding:* JAMES GIBBARD, J. LLOYD BARRON, C.E., and ALTON S. POPE, M.D.

## SYMPOSIUM ON WATER AND MILK-BORNE INFECTIONS

The Hypothetical Relationship of Water Supplies to Poliomyelitis.  
KENNETH F. MAXCY, M.D.

Safety of the Milk Supply and Reduced Mortality. HERMAN N. BUNDESEN, M.D., and PAUL F. KRUEGER.

Brucellosis: Consideration of Its Epidemiology, Diagnosis and Control.  
CARL F. JORDAN, M.D., I. H. BORTS, M.D., D. M. HARRIS, M.D., and J. R. JENNINGS, C.E.

Field and Laboratory Studies on Water-borne Gastroenteritis. RALPH E. WHEELER, M.D., and ROY C. AVERY.

## LABORATORY

*Second Session—Committee Room C, Auditorium**Presiding:* PEARL L. KENDRICK, Sc.D.

The Isolation of *Neisseria flava* from the Genitourinary Tract of Three Patients. CHARLES M. CARPENTER, M.D.

A Report on Methods of Transmitting Material to a Laboratory for *Gonococcus* Cultural Studies. OSCAR F. COX, M.D., and MARY V. McDERMOTT.

Reversibility of Sensitization of Erythrocytes. G.M. KALMANSON, Ph.D., and J. J. BRONFENBRENNER, Dr.P.H.

Four Years' Use of the Kahn Presumptive Test as a Screening Agency in the Serology of Syphilis. E. L. WEBB.

Studies on the Kahn Verification Test. ELIZABETH B. McDERMOTT, JACOB ADLER, M.D., STANLEY MARCUS, ELLA BRANDON, HOWARD J. NUNES, and REUBEN L. KAHN, Sc.D.

The Effect of Age of Specimens on the Results of Serological Tests for Syphilis. ANNE KIMBALL, Ph.D.

## ORAL HEALTH GROUP

*First Session—Committee Room 3C, Auditorium**Presiding:* ALLEN O. GRUEBBEL, D.D.S., *Chairman.*

## WEDNESDAY, 9:30 A.M.

## FOOD AND NUTRITION

*Third Session—Committee Room 3C, Auditorium*

Report of the Coördinating Committee. *Chairman*, F. C. BLANCK, PH.D.

Report of the Committee on Microbiological Examination of Foods.  
*Chairman*, HARRY E. GORESLINE, PH.D.

Report of the Committee on Nutritional Problems. *Chairman*, E. V. MCCOLLUM, PH.D.

Report of the Committee on Foods (Except Milk). *Chairman*, BERNARD E. PROCTOR, PH.D.

Report of the Joint Committee on Analyzing Frozen Desserts. *Chairman*, FREDERICK W. FABIAN, PH.D., and *Chairman*, FRIEND LEE MICKLE, SC.D.

Report of the Committee on Food Utensil Sanitation. *Chairman*, GEORGE J. HUCKER, PH.D.

Report of the Committee on Assay of Foods. *Chairman*, CARL R. FELLERS, PH.D.

Report of the Committee on Membership and Fellowship. *Chairman*, RACHEL L. REED.

## PUBLIC HEALTH EDUCATION

*Second Session—Assembly Room 3, Auditorium*

*Presiding:* D. OBERTEUFFER, PH.D.

## HEALTH EDUCATION, WAR AND DEFENSE

First Aid Instruction in Relation to Health Education. ALBERT McCOWN, M.D.

Health Education in Extra-Cantonment Zones. Speaker to be announced.

Health Education in the National Nutrition Program. Speaker to be announced.

*Discussion.*

## WEDNESDAY, 11:30 A.M.

*Second General Session—Opera House, Auditorium*

*Presiding:*

## WAR AND THE HEALTH DEPARTMENT

Across the Nation. Speaker to be announced.

In an Eastern City. Speaker to be announced.

In a Western County. Speaker to be announced.

WEDNESDAY, 12:30 P.M.

### INDUSTRIAL HYGIENE

*Luncheon Session—Crystal Room, Hotel New Jefferson*

Address: A representative of Great Britain.

Report of the Committee on Skin Irritants. *Chairman, LOUIS SCHWARTZ, M.D.*

Report of the Committee on Ventilation and Atmospheric Pollution. *Chairman, EMERY R. HAYHURST, M.D.*

Report of the Committee on Standard Methods for the Examination of Air. *Chairman, EMERY R. HAYHURST, M.D.*

Report of the Committee on Lead Poisoning. *Chairman, ROBERT A. KEHOE, M.D.*

Report of the Committee on Pneumoconiosis. *Chairman, R. R. SAYERS, M.D.*

Report of the Committee on Industrial Anthrax. *Chairman, HENRY FIELD SMYTH, M.D.*

Report of the Committee on Volatile Solvents. *Chairman, HENRY FIELD SMYTH, JR., M.D.*

### AMERICAN SCHOOL HEALTH ASSOCIATION AND ORAL HEALTH GROUP

*Joint Luncheon Session—Roof Garden, Hotel Statler*

*Presiding: ARTHUR R. TURNER, M.D., and ALLEN O. GRUEBBEL, D.D.S.*

What Is the Private Dentist's Part in the School Health Program?  
*GEORGE M. WHEATLEY, M.D.*

### FOOD AND NUTRITION

*Luncheon Session—Ivory Room, Hotel New Jefferson*

Program to be announced.

### JOHNS HOPKINS UNIVERSITY ALUMNI

*Luncheon Session—Room 1, Hotel New Jefferson*

WEDNESDAY, 2:30 P.M.

### PROFESSIONAL EDUCATION

*Special Session—Assembly Room 2, Auditorium*

*Presiding: WILLIAM P. SHEPARD, M.D., Chairman, Committee on Professional Education.*

Program to be announced.

## WEDNESDAY, 2:30 P.M.

## LABORATORY

*Third Session—Assembly Room 1, Auditorium**Section Business.*

Report of the Standard Methods Committee for the Examination of Disinfectants and Antiseptics. *Chairman*, STUART MUDD, M.D.

Germicidal Vapors as a Means of Disinfection of Air. O. H. ROBERTSON, M.D.

Ultra-Violet Irradiation as a Means of Disinfection of Air. ALEXANDER HOLLAENDER, PH.D.

Relation of Length of Carbon Chain to the Primary and Functional Toxicities of Alcohols. HENRY WELCH, PH.D., and G. G. SLOCUM, PH.D.

Changes in the Bacterial Cell Brought About by the Action of Germicides as Demonstrated by the Electron Microscope. STUART MUDD, M.D.

Variations in Phenol Coefficient Determinations of Certain Disinfectants. CHARLES M. BREWER, PH.D.

Bacterial Contaminations in Sulfonamide Products. C. VIRGINIA FISHER, PH.D., N. J. ACCOUSTI, and MARVIN R. THOMPSON, PH.D.

PUBLIC HEALTH EDUCATION AND PUBLIC HEALTH  
NURSING SECTIONS AND AMERICAN SCHOOL  
HEALTH ASSOCIATION

*Joint Session—Opera House, Auditorium*

*Presiding:* SALLY LUCAS JEAN, ALMA C. HAUPT, R.N., and CHARLES H. KEENE, M.D.

## COMMUNITY ORGANIZATION FOR HEALTH EDUCATION

The Florida State-wide Public Health Committee. JEAN HENDERSON.

The Nine Counties in Michigan. Speaker to be announced.

Health Education in a Medium Urban Community. EARLE G. BROWN, M.D.

The Nurse's Part in Health Education. Speaker to be announced,

## ENGINEERING\*

*Second Session—Committee Room 3B, Auditorium*

Burma Road Sanitation. ARTHUR MORRILL and H. A. JOHNSON.

## SYMPOSIUM ON INTER-AMERICAN SANITARY ENGINEERING

Led by Sanitary Engineers from South America

Army Water Supply Problems. LIEUTENANT COLONEL JACK J. HINMAN, JR.



WEDNESDAY, 2:30 P.M.

## VITAL STATISTICS

*First Session—Committee Room 3A, Auditorium**Presiding: R. N. WHITFIELD, M.D., Chairman.**Section Business.*Residence Allocation in Connection with Deaths in the Military Service.  
Speaker to be announced.*Discussion.*

Migration: Especially Its Effect on Population Estimates. Speaker to be announced.

*Discussion.*

## FOOD AND NUTRITION

*Fourth Session—Assembly Room 3, Auditorium*

## SYMPOSIUM ON NUTRITIVE VALUES OF DRIED AND DEHYDRATED FRUITS AND VEGETABLES

Home Drying Methods and Their Effect on the Palatability, Cooking Quality, and Nutritive Value of Foods. ESTHER L. BATCHELDER, Ph.D.

Dehydration Procedures and Their Effect on Vitamin Retention. E. M. CHACE.

Losses of Vitamins Which May Occur During the Storage of Dehydrated Vegetables. D. K. TRESSLER, Ph.D., J. C. MOYER, and KATHERINE A. WHEELER.

Losses of Vitamins Which May Occur During the Cooking of Dehydrated Vegetables. FAITH FENTON, BARBARA BARNES, J. C. MOYER, and KATHERINE A. WHEELER.

## EPIDEMIOLOGY

*Second Session—Committee Room 3C, Auditorium*

## SYMPOSIUM ON TUBERCULOSIS

Tuberculosis Survey among the Employees of Santiago, Chile. BENJAMIN VIEL, M.D., and EDUARDO JELIC, M.D.

Pulmonary Tuberculosis Resulting from Extra-Familial Contacts. CLAIRE W. TWINAM, M.D., and ALTON S. POPE, M.D.

Infection, Morbidity and Mortality among Associates of Cases of Tuberculosis in Old Age. HOWARD C. STEWART, M.D., R. S. GASS, M.D., and W. C. WILLIAMS, M.D.

Initial X-ray Findings and Subsequent Mortality from Tuberculosis in Infected White and Colored Children of Various Ages. MIRIAM E. BRAILEY, M.D.

Some Epidemiological Aspects of Tuberculosis Determined by Analysis of Sanatorium Records. ROY M. SEIDEMAN, M.D.

Tuberculosis Follow-up in Westchester County. GEORGE H. RAMSEY, M.D., and MARJORIE BELLOWES.

WEDNESDAY, 6:30 P.M.

ENGINEERING SECTION, CONFERENCE OF STATE SANITARY ENGINEERS, AND CONFERENCE OF MUNICIPAL PUBLIC HEALTH ENGINEERS

*Annual Engineers' Stag Dinner—Ivory Room, Hotel New Jefferson*

PUBLIC HEALTH EDUCATION

*Dinner Session—Crystal Room, Hotel New Jefferson*

*Presiding: SALLY LUCAS JEAN.*

GOODWILL SESSION

*Section Business.*

A Health Education Program in Industry. EDWARD A. POOLE.

THURSDAY, 8:00 A.M.

AMERICAN SCHOOL HEALTH ASSOCIATION

*Breakfast Session—Adam Room, Hotel Statler*

*Presiding: EARL E. KLEINSCHMIDT, M.D., President.*

Committee Reports:

National Defense  
Physical Fitness  
Professional Education  
Committee coöperating with United States Office of Education Wartime Commission  
Committee coöperating with Dictionary of Education  
Nominating

AMEROPS

*Breakfast Session—Room 3, Hotel New Jefferson*

GEORGE PEABODY COLLEGE FOR TEACHERS  
ALUMNAE

*Breakfast Session—Room 1, Hotel New Jefferson*

MASSACHUSETTS INSTITUTE OF TECHNOLOGY ALUMNI

*Breakfast Session—Crystal Room, Hotel New Jefferson*

UNIVERSITY OF MINNESOTA ALUMNI

*Breakfast Session—Room 9, Hotel New Jefferson*

THURSDAY, 9:30 A.M.

## LABORATORY

*Fourth Session—Assembly Room 2, Auditorium**Presiding:* WALTER L. MALLMANN, PH.D.Report of the Standard Methods Committee on Examination of Water and Sewage. *Chairman,* WALTER L. MALLMANN, PH.D.Report of the Standard Methods Committee for the Examination of Shellfish. *Chairman,* JAMES GIBBARD.

Progress Report on Methods of Analysis for Iodine in Water. JOHN T. TRIPP, PH.D.

Laboratory Methods for the Sanitary Evaluation of Shellfish. LESLIE A. SANDHOLZER, PH.D.

A Comparative Study of Presumptive and Confirmative Media for Bacteria of the Coliform Group and for Fecal Streptococci. A.A. HAJNA and C. A. PERRY, SC.D.

A Comparison of Methods Employed in the Detection of Coliform Bacteria in Milk. LESLIE A. SANDHOLZER, PH.D., MILDRED K. HAVENS, ALICE WALKER, and MARY STRONG.

Irregularities in Agar Plate Counts of Pasteurized Milk. W. L. WILLIAMS.

## INDUSTRIAL HYGIENE

*Third Session—Assembly Room 3, Auditorium*SYMPOSIUM ON CHEMICAL AND ENGINEERING METHODS IN  
INDUSTRIAL HYGIENE

Newer Problems in Industrial Ventilation. W. C. L. HEMMON.

A Critical Study of the Phenylsulfonic Acid Method for the Determination of the Oxides of Nitrogen. Speaker to be announced.

The Determination of Halogenated Hydrocarbons. FREDERICK H. GOLDMAN, PH.D.

The Collection, Determination, and Identification of Solvent Vapors. WILLIAM G. FREDRICK, SC.D.

A Practical Housekeeping Program for Industry. HERBERT G. DYKTOR.

## MATERNAL AND CHILD HEALTH

*Third Session—Rooms 2, 7, and 8, Hotel New Jefferson*

Round Tables (three running simultaneously).

THE ESTABLISHMENT AND MAINTENANCE OF NORMAL APPETITE AS  
A MAJOR FACTOR IN THE PREVENTION OF MALNUTRITION

Program to be announced.

THURSDAY, 9:30 A.M.

LABORATORY AND EPIDEMIOLOGY SECTIONS

*Joint Session—Assembly Room 1, Auditorium*

*Presiding:* JAMES GIBBARD and ALTON S. POPE, M.D.

SYMPOSIUM ON RESPIRATORY DISEASES

The Epidemiology of Streptococcic Infections. FRANCIS F. SCHWENTER, M.D. and JOHN H. JANNEY, M.D.

The Work of the Meningitis Commission. JOHN J. PHAIR, M.D., LIEUTENANT COLONEL A. PARKER HITCHENS, M.C., ELVIN A. KABAT, MARY B. KIRKBRIDE, Sc.D., PERRIN H. LONG, M.D., and C. PHILIP MILLER.

Epidemiological Problems Presented by World-wide Distribution of Troops. L. T. COGGESHALL, M.D.

Milk-borne Epidemics Due to Serologically Typed Hemolytic Streptococci. T. D. DUBLIN, M.D.

Immunization Against Scarlet Fever. GAYLORD W. ANDERSON, M.D.

Precipitin and Agglutinin Formation in the Blood of Streptococcus Infected Patients and Their Family Contacts. PARKER DOOLEY, M.D. and HELEN V. KARR.

FOOD AND NUTRITION SECTION AND AMERICAN  
SCHOOL HEALTH ASSOCIATION

*Joint Session—Assembly Room 4, Auditorium*

*Presiding:* HENRY T. SCOTT, Ph.D., and AMOS L. BEAGHLER, M.D.

NUTRITION AND HEALTH IN TIME OF WAR

Nutritional Needs of American Youth. H. D. KRUSE, M.D.

National Nutrition in Relation to Selective Service. BRIGADIER GENERAL LEWIS B. HERSHEY.

Dental Defects in Children. RUTH E. MARTIN, D.D.S.

The Outlook for the Future in War Economy. RICHARD W. VILTER, M.D.

HEALTH OFFICERS, ENGINEERING, AND PUBLIC  
HEALTH NURSING SECTIONS

*Joint Session—Opera House, Auditorium*

*Presiding:* ABEL WOLMAN, DR.ENG.

GEARING PUBLIC HEALTH TO MEET WARTIME CONDITIONS

*Panel:*

Health Officers—E. R. COFFEY, M.D., and WILTON L. HALVERSON, M.D.

Engineers—ARTHUR P. MILLER, C.E. Other participants to be announced.

Public Health Nurses—MARIAN SHEAHAN, R.N. Other participants to be announced.

Oral Health Group—WALTER PELTON, D.D.S.

THURSDAY, 12:30 P.M.

PUBLIC HEALTH EDUCATION

*Luncheon Session—Crystal Room, Hotel New Jefferson*

Health Education and the Schools. HOMER W. ANDERSON.

DELTA OMEGA

*Luncheon Session—Ivory Room, Hotel New Jefferson*

THURSDAY, 2:30 P.M.

HEALTH OFFICERS AND ENGINEERING SECTIONS

*Joint Session—Opera House, Auditorium*

*Presiding:* SAMUEL L. SALASIN, M.D., and ROY J. MORTON.

SYMPOSIUM ON ENVIRONMENTAL SANITATION

Present Epidemiological Basis of Environmental Sanitation. GAYLORD W. ANDERSON, M.D.

*Discussion:* EDWARD S. GODFREY, JR., M.D.

Joint Responsibilities and Indirect Services of the Health Department. J. LLOYD BARRON, C.E.

*Discussion:* L. M. GRAVES, M.D.

Basic Criteria for Qualified Leadership in the Environmental Sanitation Program. FELIX J. UNDERWOOD, M.D.

*Discussion:* H. G. BAITY, Sc.D.

MATERNAL AND CHILD HEALTH

*Third Session—Assembly Room 4, Auditorium*

THE LOCAL HEALTH ADMINISTRATOR TAKES A LONG LOOK  
AT SCHOOL HEALTH SERVICES

Program to be announced.

INDUSTRIAL HYGIENE

*Fourth Session—Assembly Room 3, Auditorium*

Acute Toxicity of Ethylene Glycol Ethers. HAROLD W. WERNER, Ph.D.

Physiological Response to Magnesium Dust. LEROY U. GARDNER, M.D.

Monomeric Styrene. DON D. IRISH, Ph.D.

Eye Hazards in Industry and Their Control—An Industrial Health Problem. Speaker to be announced.

THURSDAY, 2:30 P.M.

## LABORATORY

*Fifth Session—Assembly Room 1, Auditorium**Presiding:* FRIEND LEE MICKLE, SC.D.Report of the Standard Methods Committee on Examination of Dairy Products. *Chairman,* ROBERT S. BREED, PH.D.Report of the Standard Methods Committee for Frozen Desserts and Ingredients. *Chairman,* FRIEND LEE MICKLE, SC.D.

## THE LABORATORY CONTROL OF MILK UNDER WAR CONDITIONS

*Discussion Panel:*

ROBERT S. BREED, PH.D.

A. W. FUCHS, C.E.

C. K. JOHNS, PH.D.

H. SCHARER

R. V. STONE, D.V.M.

WALTER D. TIEDEMAN, M.C.E.

## LABORATORY

*Sixth Session—Committee Room 3A, Auditorium**Presiding:* LIEUTENANT COLONEL ELLIOTT S. ROBINSON, M.C.

Blood and Malaria Parasite Staining with Eosin Azure Methylene Blue Methods. R. D. LILLIE, M.D.

The Etiology of Acute Illness Among Workers Using Low-grade Stained Cotton. ROY SCHNEITER, PAUL A. NEAL, M.D., and BARBARA H. CAMINITA.

Laboratory Aids in the Diagnosis of Virus Diseases. S. EDWARD SULKIN, PH.D., and CARL G. HARFORD, M.D.

A Rapid Laboratory Test for Early Diagnosis of Lymphocytic Choriomeningitis. JOSEPH ZICHIS, PH.D.

Types of Hemolytic Streptococci Found in Scarlet Fever. LILLIAN BUXBAUM and PAUL A. DI SANT'AGNESE, M.D.

THURSDAY, 2:30 P.M.

## VITAL STATISTICS

*Second Session—Committee Room C, Auditorium*

## Committee Reports.

Errors in Clinical Statements on Causes of Death—Part II. (Continuation of work reported last year.) HAVEN EMERSON, M.D. and KURT POHLEN, PH.D.

Accuracy of Tuberculosis Death Rates in Williamson County, Tennessee. RUTH R. PUFFER, HOWARD C. STEWART, M.D., and W. C. WILLIAMS, M.D.

FOOD AND NUTRITION AND PUBLIC HEALTH  
NURSING SECTIONS*Joint Session—Opera House, Auditorium*

*Presiding:* HENRY T. SCOTT, PH.D., and ALMA C. HAUPT, R.N.

The New Public Health Nursing Curriculum. MARY J. DUNN.

Teaching the Family Sane Nutrition. Speaker to be announced.

*Discussion.*

THURSDAY, 7:00 P.M.

## THIRD GENERAL SESSION

*Annual Banquet—Gold Room, Hotel New Jefferson*

*Presiding:* JOHN L. RICE, M.D., *President, American Public Health Association.*

*Presentation of Forty Year Membership Certificates.*

*Announcement of Health Conservation Contest Awards.*

## FRIDAY, 9:30 A.M.

## LABORATORY

*Seventh Session—Committee Room 3A, Auditorium**Presiding:* ROBERT S. BREED, PH.D.

Some Observations on Mold Mycelia in Cream and Butter. H. C. OLSON, PH.D.

Heat Resistant Organisms in Milk Supplies. W. D. DOTERRER.

Trends in Laboratory Procedures in the Milk Control Program of St. Louis. JANE HERSHEY, PH.D., HARRY WALDRIP, and JOSEPH C. WILLETT, D.V.M.

Milk Laboratories in Defense Areas. LUTHER A. BLACK, PH.D.

Recent Advances and Present Problems in Milk Sanitation:

*In Mexico**In Cuba**In Puerto Rico*

Speakers to be announced.

## LABORATORY

*Eighth Session—Committee Room C, Auditorium*

Method of Assay and Preparation of Bacterial Pyrogen. HENRY WELCH, PH.D., H. O. CALVERY, PH.D., W. T. McCLOSKEY, and C. W. PRICE.

Studies on Pertussis Endotoxin with the Use of Semi-Synthetic Media. LYON P. STREAN, PH.D.

Results of Use of the Agglutinogenic Intradermal Test for Susceptibility to Whooping Cough. EARL W. FLOSDORF, PH.D., HARRIET C. FELTON, M.D., A. BONDI, PH.D., and AIMS C. MCGUINNESS, M.D.

Evaluation of the Antigenicity of Tetanus Toxoid. W. L. KOERBER, PH.D.

The Development and Management of a Cotton Rat Colony. D. B. MEYER, D.V.M., and M. MARSH.

## MATERNAL AND CHILD HEALTH

*Fourth Session—Committee Room 3C, Auditorium*

## MATERNAL AND CHILD HEALTH SERVICES IN WAR TIME

Health Standards for Day-Care Centers for Children. Speaker to be announced.

Evacuation Planning for Mothers and Children. Speaker to be announced.

Medical Care for Dependents of Men in Military Service. Speaker to be announced.



FRIDAY, 9:30 A.M.

## EPIDEMIOLOGY

*Third Session—Assembly Room 3, Auditorium*

Epidemiology of Plague in Ecuador. Atilio Macchiavello, M.D.

Poliomyelitis in Cuyahoga County, Ohio, 1941. Morton Kramer, John A. Toomey, M.D., Harold J. Knapp, M.D., and James A. Doull, M.D.

Epidemiological Aspects of Dental Caries. Bion R. East, D.D.S.

Epidemiology of Pneumococcus Pneumonia: A Study, Including Bacteriological and Serological Observations, in a Rural Community during a Season of High Incidence. Edward S. Rogers, M.D., Anne M. Bahlke, M.D., and Albert H. Harris, 2nd, M.D.

An Outbreak of Staphylococcal Food Poisoning. J. Earl Smith, M.D., and Nathan Nagle.

## AMERICAN SCHOOL HEALTH ASSOCIATION

*Second General Session—Committee Room 3B, Auditorium**Presiding:* S. B. McPheeters, M.D.THE MASSACHUSETTS STUDY OF HEALTH IN SENIOR  
HIGH SCHOOLS

Health Status and Need for Health Service Programs. Jean V. Latimer.

Testing Technics and Procedures. Warren H. Southworth.

Significant Findings of the Study and Their Relation to Planning Health Education Programs. Clair E. Turner, Dr.P.H.

## ENGINEERING

*Third Session—Assembly Room 2, Auditorium*

The Privy and National Public Health. Roy N. Johnston.

The Development of a High Rate Activated Sludge Process Through Recirculation. John Alexander Logan, D.Sc.

Disinfection of Air. W. F. Wells.

The Relationship between Coliform Organisms and the Typhoid Group. Robert Webster Kehr, C.E.

Occurrence of the Escherichia, Aerobacter and Intermediate Sections of the Coliform Group in Oysters Taken from Rhode Island and Nearby Waters. Dorothy Baumes Phelps. (To be read by title only.)

FRIDAY, 9:30 A.M.

INDUSTRIAL HYGIENE AND FOOD AND NUTRITION  
SECTIONS

*Joint Session—Assembly Room 1, Auditorium*

*Presiding:* WILLIAM P. YANT and HENRY T. SCOTT, PH.D.

Food and Nutrition of the Industrial Worker in Wartime. FRANK G.  
BOUDREAU, M.D.

Teaching Nutrition to the Families of Industrial Workers. EVELYN  
HOLLEN.

The Functions of Nurses in Industry. OLIVE M. WHITLOCK, R.N.

Improved Dental Health for Workers. LYMAN D. HEACOCK, D.D.S.

FRIDAY, 11:30 A.M.

FOURTH GENERAL SESSION

*Assembly Room 4, Auditorium*

HEALTH COUNCILS AND PRIVATE AGENCIES

*Presiding:* HOMER FOLKS, LL.D.

*Speakers:*

LOUIS I. DUBLIN, PH.D.

SELSKAR M. GUNN

PHILIP S. PLATT, PH.D.

FRIDAY, 12:30 P.M.

NATIONAL ORGANIZATION FOR PUBLIC HEALTH  
NURSING

*Luncheon Session—Ivory Room, Hotel New Jefferson*

FRIDAY, 2:30 P.M.

FIFTH GENERAL SESSION

*Assembly Room 1, Auditorium*

HIGHLIGHTS OF THE 71ST ANNUAL MEETING

A SUMMARY OF THE SCIENTIFIC SESSIONS

*Presiding:* REGINALD M. ATWATER, M.D.

*Panel Participants:*

A spokesman from each of the ten Sections.

## THE TECHNICAL EXHIBITS AUDITORIUM

**EXHIBITORS** in the Twenty-Fourth Health Exhibit, sponsored by the American Public Health Association in connection with its 71st Annual Meeting, describe the exhibits they are preparing for the information of delegates as follows:

### A. S. ALOE COMPANY

ST. LOUIS, MO. Nos. 78 AND 79  
Laboratory apparatus and equipment of interest to the Public Health and allied worker. Modern equipment for the preparation of human blood plasma and its administration will be shown. The new Chapple Infant Incubator, having complete environmental control, will be on exhibit and will be demonstrated. New and recent scientific apparatus, serological water baths, apparatus for industrial hygiene tests—such as equipment for the determination of lead in blood and urine—will also be presented.

### AMERICAN BOTTLERS OF CARBONATED BEVERAGES

WASHINGTON, D. C. Nos. 23 AND 24  
The glass-paneled Field Laboratory on display here is the motorized unit of the American Bottlers of Carbonated Beverages, national association of the soft drink industry. Pioneer in its field, the unit carries sufficient chemical, bacteriological, and engineering apparatus to make specialized investigations and quality control tests on carbonated beverages in bottling plants throughout the United States. The Field Laboratory, in bringing its unique individual service to the bottlers, operates as an adjunct to the permanent laboratory of the association located in Washington, D. C.

### AMERICAN CAN COMPANY

NEW YORK, N. Y. Nos. 59 AND 60  
Convention delegates are cordially invited to visit Booths 59 and 60 where information is available concerning those aspects of commercially canned foods which are of particular interest to members of the American Public Health Association. The American Can Company's modern, single-service, paper milk container will also be featured.

### THE BEST FOODS, INC.

NEW YORK, N. Y. No. 65  
Booth 65 dramatizes the manufacture of Nucoa, the Modern Vegetable Margarine. The display features the elaborate testing carried on to maintain the uniform quality of Nucoa and its consistent Vitamin A potency of 9,000 USP units per pound. Highlighted also are the fine flavor and texture of Nucoa and the increasingly important place of fortified margarine in the national nutrition program.

### THE BORDEN COMPANY

NEW YORK, N. Y. No. 3  
The Borden Company will exhibit an attractive display of milk products. Convention delegates are invited to visit Booth 3 for nutrition material planned for practical use in both home and office.

### CAMEL CIGARETTES—MEDICAL RELATIONS DIVISION

NEW YORK, N. Y. Nos. 34 AND 35  
CAMEL Cigarettes will exhibit large detailed photographs of equipment used in comparative tests of the five largest

selling brands of cigarettes. These tests proved that CAMELS burn slower and contain less nicotine in the smoke than other cigarettes. Representatives will be available to discuss this research.

### CARNATION COMPANY

OCONOMOWOC, WIS. Nos. 45 AND 46  
In the Carnation Company exhibit in Booths 45 and 46 you will see a complete and dramatic presentation of the story of Irradiated Carnation Milk. Every operation in the processing—from farm to finished product—is performed in miniature before your eyes. You will enjoy this personally conducted tour through a Carnation evaporating plant.

### CHURCH & DWIGHT CO., INC.

NEW YORK, N. Y. No. 47  
Twenty-five years before the first meeting of The American Public Health Association, Church and Dwight Company pioneered in first producing Bicarbonate of Soda in the Western Hemisphere. For nearly a century, this company has endeavored to improve its product and make it available at low cost. Today, Arm & Hammer Bicarbonate of Soda, known generally as Baking Soda, can be found in nearly every household. The low cost, purity and availability of Arm & Hammer, and the fact it is approved as a dentifrice by the American Dental Association Council, are reasons so many Health Officers recommend it in their Dental Health Educational work.

### CLAY-ADAMS COMPANY, INC.

NEW YORK, N. Y. No. 10  
The Clay-Adams Company exhibit comprises three types of equipment.  
INSTRUMENTS AND SUPPLIES  
new cardboard slide  
blood and other  
slides and cover  
glasses, agglutination slides, slide boxes  
and specialties for microscopy.

EDUCATIONAL including anatomical charts and models, skeletons, Ayers and other obstetrical manikins, Chase Hospital Dolls.

MEDICAL AND SURGICAL SPECIALTIES including Cacoprene (synthetic rubber) catheters, drains, tubes, utility forceps, and Justrite Elastic Dressing.

### THE COCA-COLA COMPANY

ATLANTA, GA. No. 37  
If sugar rationing and other considerations permit, we plan to distribute Coca-Cola with our compliments to those attending the meeting.

### THE CREAM OF WHEAT CORPORATION

MINNEAPOLIS, MINN. No. 53  
THE CREAM OF WHEAT CORPORATION, Minneapolis, Minnesota (Booth 53), will exhibit Enriched 5-Minute "CREAM OF WHEAT." This improved cereal is completely cooked in five minutes and has been fortified with additional Vitamin B<sub>1</sub> (Wheat Germ and Thiamin), iron, calcium, and phosphorus.

**R. B. DAVIS SALES CO.**

HOBOKEN, N. J. No. 43

You are cordially invited to enjoy a drink of delicious Cocomalt at Booth 43. Cocomalt is a milk-fortifier, designed to be mixed with milk and served hot or cold. The food value and palatability of milk are considerably increased by the addition of this vitamin and mineral enriched food. Cocomalt is fortified with vitamins A, B<sub>1</sub> and D and minerals calcium, phosphorus and iron. Ask our representatives for reprints on our medical studies.

**THE DICK X-RAY CO.**

St. Louis, Mo. No. 4

We contemplate exhibiting at this meeting the Westinghouse Photo-Fluorographic x-ray unit, together with the Portable Dynex X-ray Generator. We will also show several types of Viewing equipment for this 35 mm. Photo-Fluorographic film. This unit is ideal for survey work in connection with the Public Health Service and many of the institutions and associations are using it for that purpose. Our representatives at the booth will explain this unit thoroughly to anyone who desires further information without any obligation on his part.

**DIFCO LABORATORIES  
INCORPORATED**

DETROIT, MICH. No. 18

Exhibit of dehydrated culture media prepared according to the formulae of the American Public Health Association's "Standard Methods of Water Analysis" and "Standard Methods for the Examination of Dairy Products," as well as other media of particular interest in public health bacteriology.

Demonstration of Bacto-SS Agar, Bacto-MacConkey Agar and other media for isolation and identification of members of the typhoid-paratyphoid-dysentery group.

**THE DIVERSEY CORPORATION**

CHICAGO, ILL. No. 72

An educational display of real interest to all in attendance will be shown by The Diversey Corporation, Chicago, Ill. The principal section of the display consists of a three-panelled walnut background on which are mounted photographs and descriptive material showing the part played by Diversey Products and Diversey Service in maintaining public health standards. Every phase of modern cleaning and sterilization will be illustrated. The exhibit will be in charge of Mr. Lewis Shere, Vice-President.

**EVAPORATED MILK ASSOCIATION**

CHICAGO, ILL. No. 77

Of special interest to public health workers is the educational material of the Evaporated Milk Association. These publications are designed for use by public health departments in their nutrition programs, for maternal welfare centers, well-baby clinics and social service activities. Special materials are available on low-cost family feeding, prenatal, infant and pre-school child feeding, school lunches, and quantity food preparation. New material prepared in cooperation with the National Nutrition Program will be on display at our booth.

**THE J. B. FORD SALES CO.**

WYANDOTTE, MICH. No. 36

A complete line of Wyandotte Products for food and beverage plant sanitation will be on display.

Wyandotte Steri-Chlor, a chlorine powder, used in solution, for germicidal and deodorizing operations.

Wyandotte Dish and Glass Washing Compounds for hand and machine use in all kinds of water.

Wyandotte Detergent for washing painted surfaces, cleaning porcelain and floors.

Wyandotte Bottle Washing Materials for milk and beverage plants.

Cleaners for every requirement of the Dairy Industry—including smaller packages for dairy farmers.

Other Wyandotte Products for general cleaning in food manufacturing and canning plants, hospitals, schools, hotels, public buildings.

**GERBER PRODUCTS COMPANY**

FREMONT, MICH. No. 61

GERBER'S



The Gerber booklets for mothers and the professional filing cards showing nutritive values of average servings, will be available at booth 61. You will be interested in examining the complete line of Gerber Foods.

**THE GILLILAND LABORATORIES,  
INC.**

MARIETTA, PA. No. 12

The Gilliland Laboratories will have on display at Booth 12 a complete line of Biological Products. This firm gives special attention to supplying Biological Products to State, City, and County Boards of Health, Hospitals and Institutions. The representative in charge of this exhibit will be pleased to answer any inquiries.

**GRADWOHL SCHOOL OF LABORATORY TECHNIQUE**

St. Louis, Mo. No. 2

This exhibit will show first a twenty-minute method of diagnosis of primary lesions of syphilis by frozen section and staining technique, thus obtaining a much higher percentage of accurate positives than the dark-field method; second, new facts on blood groups with demonstration of the Rh factor—an explanation of transfusion reactions, stillbirths, and miscarriages, and Erythroblastosis fetalis; and, third, motion picture of methods of teaching laboratory technique.

**HYGEIA, THE HEALTH  
MAGAZINE**

CHICAGO, ILL. No. 51

The HYGEIA Exhibit will consist of a three panel display featuring a Blow-up of a HYGEIA cover design showing a baby in a bathtub. The other two panels contain editorial matter on HYGEIA. The whole material may be set up on a table 8 feet in length. A table at the front of the booth for issuing of sample copies and other material is used. The three panel display is lighted.

**KELLOGG COMPANY**

BATTLE CREEK, MICH. No. 73

Kellogg's ready-to-eat cereals play a vital part in good nutrition. They supply whole grain (natural or restored) values, as recommended by the United States nutrition food rules. Whole grain products or enriched white bread and flour or cereal products restored to their original whole grain nutritive value should be eaten daily.

Recent nutrition information is available at the Kellogg Booth. Also, ask for your set of medical reprints covering recent research with bran.

**KIMBLE GLASS COMPANY**

VINELAND, N. J. No. 13

Kimble Blue Line Exax and Normax Precision Rtested graduated ware and Kimble K Brand laboratory glassware and apparatus.

New. Brewer culture dish cover, an ingenious but simple device for easy cultivation of anaerobes without expensive equipment.

Especially featured. Bottles and other glass parts for preparation and injection of parenterals, particularly blood plasma. These are highly resistant to chemical attack, offering maximum assurance of unimpaired quality and clinical safety.

All material obtainable from laboratory supply houses.

**LEDERLE LABORATORIES, INC.**

NEW YORK, N. Y. Nos. 74, 75 AND 76

Sulfadiazine, the preferable sulfonamide of choice in pneumococcal infections, will be the focal point in Lederle's exhibit. This product was developed by its Sulfonamide Research Division of Lederle Laboratories. Animated charts dramatize the speed of recovery under the Sulfadiazine therapy in pneumonia and illustrate other points of advantages, i.e., low toxicity, infrequent nausea, etc. IMMUNIZATION is also illustrated, featuring Lederle's Pertussis Antigen; Smallpox Vaccine; Diphtheria Antitoxin; Tetanus Antitoxin; Scarlet Fever Streptococcus Immunizing Toxin. Another section is devoted to Tuberculin Patch Test (Vollmer). Representatives of Lederle's staff will be in attendance.

**LILY-TULIP CUP CORPORATION**

NEW YORK, N. Y., AND LOS ANGELES, CALIF. Nos. 54 AND 55

Again this exhibit will feature information on the part that Lily-Tulip Cups and Containers play in the War program emphasizing the importance of the utmost in sanitation for industrial workers, school children, public use in restaurants, taverns, road stands, bars, military establishments, etc.

How Lily-Tulip Cups lower the incidence of disease in mass feeding.

**J. B. LIPPINCOTT COMPANY**

PHILADELPHIA, PA. No. 16

Of particular interest at the Lippincott exhibit are Zabriskie's "Mother and Baby Care in Pictures" and Hess and Lundeen's "The Premature Infant." Manzer's new book "Practical Sociology and Social Problems" will also be displayed. Meek's "Your Child's Development and Guidance Told in Pictures," Pillsbury's "Nursing Care of Communicable Diseases," Hasenjaeger's "Asepsis in Communicable Disease Nursing," and Ensworth and Greenwood's "Pneumonia and Its Nursing Care" are also important to Public Health Workers.

**THE MACMILLAN COMPANY**

NEW YORK, N. Y. No. 25

Of special interest to Public Health Workers, at the MACMILLAN Booth 25, will be the new book on RABIES, by Dr. Webster—"the most significant contribution to the study of rabies since the beginning of the century." Field workers and administrators alike look to COMMUNICABLE DISEASE CONTROL, by Anderson-Arnstein, and PUBLIC HEALTH ADMINISTRATION IN THE UNITED STATES, by Dr. Smillie, for answers on public health questions. Among other books will be the popular SO BUILD WE, by Mary S. Gardner, and THE PUBLIC HEALTH NURSE IN ACTION, by Marguerite Wales.

**MERCK & CO., INC.**

RAHWAY, N. J. No. 42

Chemotherapeutic agents of importance to members of the American Public Health Association will be on display at the Merck exhibit. Among these are: Vitamins—for the prevention and correction of nutritional deficiencies; Arspenamines—for the treatment of syphilis; Sulfonamides—for the treatment of gonococcal, pneumococcal, and other specific infections; Zinc Peroxide Special Medicinal—for the treatment of anaerobic wound infections; and Vinethene—for short anesthetics. Literature on these and other Merck products will be available at the Merck booth.

**MINE SAFETY APPLIANCES COMPANY**

PITTSBURGH, PA. No. 14

The M.S.A. booth will feature a complete line of personal and plant protective equipment: Gas-detecting and indicating instruments to include Carbon Monoxide Detector, Carbon Monoxide Indicator, Carbon Monoxide Alarm, Benzol Indicator, Model 1 and Model 2 Explosimeters, Explosionproof Combustible Gas Alarm, and dust sampling and counting instruments consisting of Midget Impinger, Electrostatic Dust and Fume Sampler, and Dust Counting Microscope. Dust and Mist Respirators, Cartridge Respirators, Gas Masks, Oxygen Breathing Apparatus, H-H Inhalator, Skullgard Protective Hats, First Aid Kits and Materials, Goggles, and Ear Defenders will be among the products displayed.

Both office and field representatives will be in attendance to demonstrate and discuss the equipment.

**THE C. V. MOSBY COMPANY, MEDICAL AND DENTAL PUBLISHERS**

ST. LOUIS, MO. No. 48

Public health workers attending the 71st Annual Meeting in St. Louis will find that time spent at the Mosby Booth 48, is time well spent. Among the books you're sure to find interesting are Top "Handbook of Communicable Diseases," Lynch "Communicable Disease Nursing," the new 6th edition Turner "Personal and Community Health," Turner-McHose "Effective Living," and Cameron "Bacteriology of Public Health." Whether you have a special book in mind or are "just looking" you're welcome at the Mosby Booth 48.

**NATIONAL DAIRY COUNCIL**

CHICAGO, ILL. No. 50

"Food for Victory" is the National Dairy Council animated, lighted exhibit. It presents the basic pattern for adequate daily meals as recommended by nutrition authorities. This exhibit bears the Seal of Acceptance of the Council on Foods and Nutrition, American Medical Association.

A life-size model of a homemaker points to the lighted, colored photographs of foods in the pattern. The side panel emphasizes the theme of nutrition and national Health: "Victory demands healthy Americans."

**NATIONAL LIVE STOCK AND MEAT BOARD**

CHICAGO, ILL. No. 11

The exhibit of the National Live Stock and Meat Board will portray the rôle of meat as a source of protein, calories, minerals, and vitamins in the adequate diet. Literature showing the food value of meat and the place of meat in the National Nutrition Program will be available.

**NURSE PLACEMENT SERVICE, INC.**

CHICAGO, ILL. No. 26

Anna L. Tittman, R.N., Executive Director, will be on duty throughout the meeting at Booth 26, which is set up as a temporary office with facilities for private interviews with employers of nurses and technicians (laboratory, x-ray, physiotherapy, etc.) and with nurses who desire guidance or placement in any of the fields of nursing except private duty.

**OVAL WOOD DISH CORPORATION**  
TUPPER LAKE, N. Y. No. 49

The Oval Wood Dish Corporation will display in Booth 49, its complete line of Ritespoons and Riteforks—sanitary single service eating utensils. These sanitary single service utensils are made of pure, natural, White Birch wood, have the true shape of table silver, and are manufactured under strict sanitary control. They constitute the only real substitute for metalware in the mass feeding of defense workers in industrial plants throughout the United States, in Army Post Exchanges, Navy Yards, Shipyards, etc. Members of the A.P.H.A. are cordially invited to register for samples and literature.

**PARKE, DAVIS & COMPANY**

DETROIT, MICH. No. 39

A new type of Antitoxin is featured in the colorful display of Parke, Davis and Co. in Booth 39. Other outstanding contributions in the pharmaceutical and biological fields having particular interest in war time are also displayed.

Among the featured biological products are preparations for diagnosis, prophylaxis, immunization, and treatment.

You are cordially invited to visit this exhibit where you will find several members of Parke, Davis and Company's technical staff who will be pleased to explain the meritorious features of these and other products.

**PET MILK SALES CORPORATION**

ST. LOUIS, MO. Nos. 19, 20, 21 AND 22

An actual working model of a milk condensing plant in miniature will be exhibited by the Pet Milk Company in Booths 19, 20, 21, and 22. This exhibit offers an opportunity to obtain information about the production of Irradiated Pet Milk and its uses in infant feeding and general dietary practice. Miniature Pet Milk cans will be given to each physician who visits the Pet Milk Booth.

**PETROLAGAR LABORATORIES INC.**

CHICAGO, ILL. No. 64

You are cordially invited to visit the Petrolagar exhibit where a new and enlightening story on Petrolagar, an aqueous suspension of mineral oil, will be related. Beautifully colored anatomical drawings and new literature may be had upon request from our professional representatives who will be in constant attendance.

**POWERS X-RAY SERVICE**

GLEN COVE, N. Y. No. 52

POWERS X-RAY SERVICE shows the rapid x-ray method and apparatus used by them for x-raying large groups of persons under the supervision of the medical profession. A demonstration of the comparative diagnostic clarity of the paper film and transparent base film is shown; also a typical roll of a hundred radiographs produced by this service.

All necessary equipment for making and processing the full size 14 x 17 inch radiographs is furnished as a part of the service, thus obviating any investment in chest apparatus for survey purposes.

**PROCTER & GAMBLE—IVORY SOAP**

CINCINNATI, OHIO No. 38

SIXTY-TWO YEARS' EXPERIENCE IN MAKING MILD SOAP

What is soap's effect on the skin?

What makes a soap "mild"?

What are the new and accepted techniques for Testing Soap? With the appearance today of new studies of the functions of soap—in the field of public health and medicine—we believe the Ivory Soap exhibit will hold more than casual interest for professional public health workers. We cordially invite you to visit Booth 38 where a qualified member of Procter & Gamble's scientific staff will be glad to answer questions.

**PHILIP MORRIS & CO., LTD., INC.**

NEW YORK, N. Y. No. 44

Philip Morris & Company will demonstrate the method by which it was found that Philip Morris Cigarettes, in which diethylene glycol is used as the hygroscopic agent, are less irritating than other cigarettes. Their representative will be happy to discuss researches on this subject, and problems on the physiological effects of smoking.

**RALSTON PURINA COMPANY**

ST. LOUIS, MO. No. 15

Nutrition for National Defense being our theme, we will exhibit our famous whole grain cereal products; Ralston Hot Whole Wheat Cereal; Instant Ralston Hot Whole Wheat Cereal; Shredded Ralston, Bite Size Shredded Whole Wheat Cereal; Ry-Krisp, Whole Rye Wafer.

Our miniature cereal mill will demonstrate how a whole grain cereal is made. Research literature on nutrition and samples of various products will be distributed.

**W. B. SAUNDERS COMPANY**

PHILADELPHIA, PA. No. 9

The W. B. Saunders Company welcomes you to its exhibition, at Booth 9, of its complete line of books on Medicine, Nursing, and Health. Among these will be Bauer and Hull's Health Education, new edition; Bolduan's Public Health and Hygiene; Boyd's Preventive Medicine; Geiger's Health Officers' Manual; Conrad and Meister's Teaching Procedures in Health Education; Grant's new Nursing: A Community Health Service; Stokes' Clinical Syphilology; Stokes' Dermatology and Syphilology; Pelouze's Gonorrhea; and the new Duncan's Diseases of Metabolism.

**SEALRIGHT COMPANY, INC.**

NEW YORK, N. Y. Nos. 56, 57 AND 58

**SEALTEST, INC.**

NEW YORK, N. Y. Nos. 68 AND 69

The exhibit of the Sealtest System of Laboratory Protection explains the work of this organization in dairy products research and in production control of ice cream, milk and other dairy products. The activities of the Sealtest Laboratory Kitchen will also be featured. This is the Consumer Service division of the Sealtest System, promoting the use of dairy products in the home, with special emphasis on the nutritive value of these products.

## SHARP &amp; DOHME

PHILADELPHIA, PA. NOS. 40 AND 41

Sharp & Dohme will have a striking display featuring the Roper National Immunization Survey, products used for active immunization against diphtheria, whooping cough, typhoid fever, smallpox, tetanus, and scarlet fever, together with other biological and pharmaceutical products of interest to the Public Health physician. Another striking feature will be the display on "Lyovac" Normal Human Plasma. Capable, well-informed representatives will be on hand to welcome all visitors and furnish information on Sharp & Dohme products.

## E. R. SQUIBB &amp; SONS

NEW YORK, N. Y. NOS. 62 AND 63

The Squibb Exhibit, located in Booths 62 and 63, will utilize striking visual methods to convey pertinent information about a selected list of products of particular interest to workers in the field of Public Health. We hope that all visitors attending the American Public Health Association Convention will stop in at the Squibb Exhibit. Well informed representatives will be on hand to welcome visitors and to furnish detailed information on the products displayed.

THE STANDARD REGISTER  
COMPANY

DAYTON, OHIO

No. 71

## UNITED FRUIT COMPANY

NEW YORK, N. Y. No. 70

At the United Fruit Company Booth 70, you will find an interesting display of the timely dishes which can be made with bananas and which can fit into the many phases of the present Public Health Program.

We will be pleased to have you register with us.

## WALLACE &amp; TIERNAN CO., INC.

NEWARK, N. J. NOS. 66 AND 67

The exhibit of Wallace & Tiernan Co., Inc. at the A.P.H.A. St. Louis meeting in October will feature emergency chlorination and include the W&T chlorination trailer, portable chlorinator and hypochlorinator. Photographs showing the havoc wrought in England on underground water mains as a result of bombing will be a part of our exhibit. A member of the W&T staff, thoroughly familiar with the priorities situation, will be on hand to answer questions in that connection.

## Places of Scientific Interest in the Convention City

THE St. Louis Health Division is happy to invite the delegates of the American Public Health Association to visit the many places of scientific interest in St. Louis. Despite the fact that transportation facilities will not be available as in former years, for obvious reasons, an attempt will be made by the Arrangement Committee to carry out the wishes of the delegates regarding tours to certain places that they may be interested in. A brief description of the main places of scientific interest follows:

### THE ST. LOUIS WATER WORKS

The construction of water works for the City of St. Louis was begun in 1829 by private parties under an exclusive franchise granted by the city. The city acquired ownership in 1835 and since that time the works have been in the process of improvement and enlargement almost continuously.

The location of the Intakes and Pumping Stations was changed in 1871 and again in 1892. In 1929, one hundred years after the first Water Works was started, a new plant was put in operation on the Missouri River at Howard Bend. At the Chain of Rocks the supply is pumped from the Mississippi River into six sedimentation basins having a capacity of about 200,000,000 gallons, where partial softening is effected by lime, and sedimentation is hastened by coagulation with sulfate of iron. Secondary coagulation and sedimentation in two additional basins are followed by filtration and sterilization with ammonium sulfate and chlorine. The rapid sand filters have a capacity of 160,000,000 gallons in 24 hours. The finished water flows by gravity through conduits to the High Service Pumping Stations located 3½

miles and 7 miles from the Chain of Rocks.

The Howard Bend Plant is located on the Missouri River at Howard Bend, about 16 miles from the city limits, and was built to augment the supply from the Chain of Rocks Plant. The same purification methods are followed as at the Chain of Rocks plant except that the supply passes through four basins for pre-sedimentation before the lime and iron sulfate are added and carbon dioxide can be added before filtration. The rapid sand filters have a capacity for 80,000,000 gallons per 24 hours. According to the latest annual report the total consumption for the fiscal year ending April, 1941, was 45,987,919,180 gallons and the average daily consumption was 125,994,299 gallons. A trip to the Water Works is scheduled.

### THE DAIRIES

St. Louis is fortunate in having a Standard Milk Ordinance which was adopted in December, 1936, with grading and degrading provisions and has over 90 per cent compliance. St. Louis is unique among the larger cities in the country since it has no raw milk. A trip to one of the larger dairies is planned. Arrangements will also be made for those desiring to visit farms supplying milk.

### THE UNIVERSITIES

St. Louis has two class A universities, namely, St. Louis University and Washington University. In both of these institutions visitors can obtain helpful information, for instance, Washington University has a Museum with a wonderful collection of rare specimens of bone pathology. St. Louis University is especially noted for the discovery of Theelin and vitamin K.



## THE HOSPITALS

The City Hospital was founded in 1853 and now has a capacity of 1,104. It is estimated that from 90 to 95 per cent of the city's emergency cases are taken to the City Hospital. Recently new buildings were added, and the Bliss Hospital for the observation and treatment of psychiatric cases is one of the finest in the country. The new x-ray department and the City Hospital laboratories are worth seeing.

The Robert Koch Hospital is the city's institution for the treatment of tuberculosis. This institution was built primarily for the treatment of yellow fever, and later smallpox and leprosy cases were housed there. In 1910 it was converted into a tuberculosis sanatorium, and since 1922 new buildings were erected so that at the present time it is one of the most modern institutions in the country. It is one of the few tuberculosis institutions in the country that has no wards. It has a capacity of 688. Those interested in the construction of sanatoria or in tuberculosis generally cannot afford to miss the opportunity of visiting this institution.

The City Sanitarium and the St. Louis Training School are municipal institutions for the treatment of the insane and the feebleminded children respectively.

Homer G. Phillips Hospital is the municipal hospital for Negroes. It has a capacity of 685 beds. It was constructed in recent years and is one of the largest Negro hospitals in the country. It is administered by an all Negro staff. The consulting medical staff is made up of white physicians from both universities, alternating their services.

## PRIVATE HOSPITALS

The private hospitals worthy of visiting are the Barnes Hospital, Children's Hospital, and others affiliated with the Washington University Med-

ical School. The St. Louis University group of hospitals, comprising St. Mary's Hospital, Mt. St. Rose for the treatment of tuberculosis, and the Desloge Hospital which is the main teaching hospital of St. Louis University are also well worth visiting.

Those interested in the treatment of crippled children will find that the Shriner's Hospital for Crippled Children is worth going to.

The Barnard Skin and Cancer Hospital will attempt to answer questions relating to the treatment and to the research phases of cancer, since considerable research work is constantly going on in this institution.

## OTHER PLACES OF INTEREST

School physicians and others may find it profitable to visit the Central Institute for the Deaf which is one of the finest schools of this kind in the country.

Of interest to many public health workers, and especially to those interested in public health education, will be a visit to the Library of Education, which is a part of the St. Louis public school system. This library consists of sound and colored movies on educational subjects. This library is situated at 4466 Olive Street, and arrangements for visits will be made on request.

Engineers and laboratory workers may find it profitable to visit the Anheuser-Busch Brewery which is the world's largest brewery. The officers of the brewery cordially invite the members of the American Public Health Association to visit the plant at Broadway and Pestalozzi. Since the plant consists of 110 buildings covering 70 city blocks, the regular visitor's guided tour can cover only a few of the major points of interest.

Although beer is the main product of Anheuser-Busch, Inc., many other products of vital importance in the war are also produced. A few of these are—

starches, dextrins, corn syrups, malt syrups, table syrups, pharmaceutical yeast and yeast products or derivatives, cattle feeds, and baker's yeast. Special trips through the laboratories may be arranged for a limited number of interested individuals and the regular tour will be open to all.

#### ATTRACTIONS IN THE ST. LOUIS HEALTH DIVISION

The St. Louis Health Division, which is just across the street from the Convention Hall in the Municipal Courts Building, provides many points of interest and the delegates are cordially invited to visit all sections of the Division.

The Venereal Disease Clinic—situated in the Municipal Courts Building. Those interested in the control of venereal diseases will find it profitable to pay a visit to the Venereal Disease Clinic and see how the new *Venereal Disease Ordinance*, which is probably the only one of its kind in the country, is operated. It is purely a diagnostic clinic. The treatments are given by six coöperating hospitals and clinics to whom the patients are referred and for whom the Health Division pays 50 cents per treatment.

The St. Louis Health Division Bacteriological and Chemical Laboratories are well worth visiting. It is one of the public health laboratories applying gonorrhea culture methods routinely and one of the few that has a virus laboratory. It is one of two municipal public health laboratories that exercise constant check and control over the local private laboratories in the diagnosis of venereal diseases.

A visit to the Health Division Dental Extraction Clinic in the Municipal Courts Building may be of interest to the visiting dentists. In this clinic each child receives a medical examination of the heart and lungs before anesthesia is administered.

The Pasteur Clinic is of interest. Here methods of handling and treating those bitten by suspected rabid dogs will be seen.

Visits to the Health Division Immunization Clinic which operates 8 hours daily, the St. Louis Municipal Public Health Nursing, and to the Industrial Hygiene Section will prove profitable.

Health Centers: St. Louis has ten Health Centers located in the poorer sections of the city. In each Health Center the preventive work is carried out in maternal hygiene, child hygiene, tuberculosis control, and dental hygiene. Nurses will be particularly interested in the family folder system which has recently been instituted in these Health Centers.

A visit to the Out-Patient Pneumothorax Clinic may be of interest to those in the control of tuberculosis.

#### OTHER POINTS OF INTEREST

There are many other things worth seeing in and around St. Louis by the visiting members of the American Public Health Association, such as the St. Louis Medical Society's Library, which contains an exhibit of unusual medical historical documents; also, of interest is a visit to the grave of Dr. William Beaumont who contributed so much to gastric physiology, and who is buried in Bellefontaine Cemetery.

Trips to other places which some of the delegates might wish to visit will be arranged by the Local Committee upon request. A list of such places is given here:

1. Bellefontaine Farm, which is the home for delinquent boys
2. Ridge Farm County Department for convalescent children
3. Marine Hospital
4. United States Veterans Hospital
5. St. Louis Isolation Hospital
6. Division of Hygiene Board of Education
7. St. Louis Tuberculosis Society, especially the Residential Night and Day Camp
8. Missouri School for the Blind
9. Psychiatric Clinic

10. School of Public Health Nursing, St. Louis University
11. Junior League Occupational Work Shop

It should be remembered, especially by those interested in industrial hygiene, that our larger plants are not open for inspection on account of the war.

In conclusion, it should be stated that every employee of the St. Louis Health Division will do everything possible to carry out the wishes of the delegates regarding trips to any place in and around St. Louis, if transportation facilities permit.

## OFFICERS AND EXECUTIVE COMMITTEE ST. LOUIS ANNUAL MEETING

Dr. Joseph F. Bredeck, Chairman of the Local Committee, for the Seventy-first Annual Meeting of the Association in St. Louis, Mo., October 27-30, announces the following Committee appointments:

### *Finance Committee*

B. M. Lide, Jr., *Chairman*

### *Reception Committee*

J. J. Bronfenbrenner, Ph.D., *Chairman*

E. G. McGavran, M.D., *Vice-Chairman*

### *Meeting Rooms*

Percy M. Gash, *Chairman*

Melvin Tess, M.D., *Vice-Chairman*

### *Registration*

F. H. Rein, *Chairman*

Dr. J. Earl Smith, *Vice-Chairman*

### *Scientific Trips*

J. C. Willett, D.V.M., *Chairman*

Mildred Sanderson, *Vice-Chairman*

### *Entertainment Committee*

Stephen Wolff, *Chairman*

Mrs. Virgil Loeb, *Vice-Chairman*

### *Ladies' Entertainment and Transportation*

Mrs. Martin J. Glaser, *Chairman*

Mrs. Joseph C. Peden, *Vice-Chairman*

### *Attendance*

Robert C. Farrier, M.D., *Chairman*

John Buxell, *Vice-Chairman*

### *Publicity*

H. I. Spector, M.D., *Chairman*

Mrs. Schuyler M. Smith, *Vice-Chairman*

## A.P.H.A. SUSTAINING MEMBERS, 1942

IT is now twenty-five years since Sustaining Members have been a part of the membership in this professional society. Their contributions this year, when measured in dollars, amount to 12 per cent of the income from dues. When measured in significance, however, they mean an even more substantial share in Association activity, for without such help it would be impossible to publish such reference works as the Standard Methods series in Water, in Dairy Products, in Diagnostic Procedures and Reagents, or such reports as that on the Control of Communicable Diseases, a report which in circulation perhaps exceeds any other regularly used by the professions.

In expressing again the appreciation which the Association feels toward these fourteen members, the Executive Secretary has said to them that the past year turned out to be an even more dynamic year for the public health profession than we had guessed. The need for an excellent quality of professional health work moved into the center of public attention, and the demands for people and Association services exceeded all previous records.

The reports from Honolulu and Alaska now tell us how the health departments and their related agencies moved in to protect both civil and military populations in the emergency. From the other side of the water comes

the testimony of the Right Honorable Malcolm Macdonald, formerly British Minister of Health, who emphasized before the Tolan Committee of Congress the critical importance of health services in building morale. The need for this professional society of public health workers was never more apparent.

*Sustaining Members of the A.P.H.A., 1942  
Life Insurance Group*

*Year  
Elected*

The Equitable Life Assurance Society New York, N. Y.	1918
The John Hancock Mutual Life Insurance Company Boston, Mass.	1924
The Life Insurance Company of Virginia Richmond, Va.	1925
The Metropolitan Life Insurance Company New York, N. Y.	1918
The National Life Insurance Company Montpelier, Vt.	1918

The Prudential Insurance Company of America Newark, N. J.	1917
The Sun Life Insurance Company of America Baltimore, Md.	1925
The Traveler's Insurance Company Hartford, Conn.	1933
The Union Central Life Insurance Company Cincinnati, Ohio	1918
The Western & Southern Life Insurance Company Cincinnati, Ohio	1919

*Other Individuals and Organizations*

*Year  
Elected*

The Chlorine Institute, Inc. New York, N. Y.	1928
Mrs. Moses H. Cone Baltimore, Md.	1920
The Gilliland Laboratories, Inc. Marietta, Pa.	1924
The International Association of Ice Cream Manufacturers Washington, D. C.	1928

## NOMINATIONS FOR THE GOVERNING COUNCIL

IN accordance with the By-Laws of the Association, the Nominating Committee for Governing Council members, consisting of one Fellow from each Section, reports the following nominations for the Governing Council. The By-Laws provide that "upon the petition of twenty-five Fellows, the Nominating Committee shall add the name of any Fellow to this list, provided such petition is received fifteen days before the Annual Meeting." The Chairman of the Committee is Friend Lee Mickle, Sc.D., Director of Laboratories, State Department of Health, Hartford, Conn. The other members are: Herman G. Baity, Sc.D., Engineering Section; J. V. DePorte, Ph.D., Vital Statistics Section; Albert S. Gray, M.D., Industrial

Hygiene Section; Ruth E. Grout, Ph.D., Public Health Education Section; Wilton L. Halverson, M.D., Health Officers Section; Albert C. Hunter, Ph.D., Food and Nutrition Section; Kenneth F. Maxcy, M.D., Epidemiology Section; Marian G. Randall, R.N., Public Health Nursing Section; William D. Stovall, M.D., Laboratory Section; Estella F. Warner, M.D., Maternal and Child Health Section.

There are thirty elective councillors on the Governing Council of whom ten are elected each year. The ten Fellows receiving the highest number of votes on a written ballot cast by the Fellows present and voting at the Annual Meeting in St. Louis will be elected for the three year term 1942-1945.

Gaylord W. Anderson, M.D.  
University of Minnesota  
Minneapolis, Minn.

Margaret G. Arnstein, R.N.  
State Department of Health  
New York, N. Y.

E. L. Bishop, M.D.  
Director of Health, T.V.A.  
Chattanooga, Tenn.

Walter H. Brown, M.D.  
Stanford University  
Palo Alto, Calif.

Selwyn D. Collins, Ph.D.  
U. S. Public Health Service  
Washington, D. C.

Michael M. Davis, Ph.D.  
Committee on Research in Medical Economics  
New York, N. Y.

R. D. Defries, M.D.  
University of Toronto  
Toronto, Ont.

C. Mayhew Derryberry, Ph.D.  
U. S. Public Health Service  
Washington, D. C.

V. M. Ehlers, C.E.  
State Department of Health  
Austin, Tex.

Donald G. Evans, M.D.  
State Director of Health  
Seattle, Wash.

F. W. Fabian, Ph.D.  
Michigan State College  
East Lansing, Mich.

Martin Frobisher, Jr., D.Sc.  
Johns Hopkins School of Hygiene and Public Health  
Baltimore, Md.

Jean Gregoire, M.D.  
Deputy Minister of Health  
Quebec, Que.

Selskar M. Gunn  
National Health Council  
New York, N. Y.

Prof. Charles G. Hyde  
University of California  
Berkeley, Calif.

Pearl L. Kendrick, Sc.D.  
Department of Health Laboratories  
Grand Rapids, Mich.

A. J. Lanza, M.D.  
Metropolitan Life Insurance Company  
New York, N. Y.

James P. Leake, M.D.  
U. S. Public Health Service  
Washington, D. C.

Joseph I. Linde, M.D.  
Health Officer  
New Haven, Conn.

Henry E. Meleney, M.D.  
New York University  
New York, N. Y.

Arthur P. Miller, C.E.  
U. S. Public Health Service  
New York, N. Y.

Helen S. Mitchell, Ph.D.  
Federal Security Agency  
Washington, D. C.

Ralph S. Muckenfuss, M.D.  
Director, Bureau of Laboratories  
New York, N. Y.

Alton S. Pope, M.D.  
State Department of Public Health  
Boston, Mass.

Warren J. Scott  
State Department of Health  
Hartford, Conn.

John J. Sippy, M.D.  
San Joaquin Health District  
Stockton, Calif.

F. W. Tanner, Ph.D.  
University of Illinois  
Urbana, Ill.

Katharine Tucker, R.N.  
University of Pennsylvania  
Philadelphia, Pa.

Huntington Williams, M.D.  
Commissioner of Health  
Baltimore, Md.

Robert E. Wodehouse, M.D.  
Department of Pensions and National Health  
Ottawa, Ont.

WANTED: The following issues of the *American Journal of Public Health*—July and August, 1941; and January, 1942. The Association will be glad to pay postage.

## APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

### *Health Officers Section*

Ray H. Ballard, M.D., 817 South 11th St., Laramie, Wyo., Director, Student Health Service, Univ. of Wyoming  
 Lt. Commdr. Arthur P. Black, M.C., U.S. N.R., U. S. Naval Air Station, Kingsville, Tex., Sanitation Officer  
 Albert L. Chapman, M.D., 255 Linden St., Moorestown, N. J., Dist. Health Officer  
 Hubert Flurry, M.D., 1724-24th Ave., Meridian, Miss., Trainee, Lauderdale County Health Dept.  
 William P. Frank, M.D., 2216 Winthrop Drive, Alhambra, Calif., Communicable Disease Physician, Los Angeles County Health Dept.  
 Philip J. Holabach, M.D., Whitman County Health Dept., Colfax, Wash., Health Officer  
 Raymond F. Kaiser, M.D., M.P.H., 786 30th Ave., San Francisco, Calif., Passed Asst. Surgeon, U. S. Public Health Service  
 Maurice Kamp, M.D., 217 E. Spring St., New Albany, Ind., P. A. Surgeon (R), U. S. Public Health Service  
 Romeo H. Lewis, M.D., M.P.H., 33 Warwick St., Boston, Mass., Student, Harvard School of Public Health  
 Paul A. Lindquist, M.D., M.S.P.H., 218 E. First St., Monroe, Mich., Director, Monroe County Health Dept.  
 Murphy P. Martin, M.D., P. O. Box 128, Thibodaux, La., Director, Lafourche Parish Health Unit  
 Abraham Oppenheim, M.D., Arcadia, La., Director, Bienville Parish Health Unit  
 John E. Petcoff, M.D., 2520 Monroe St., Plaza Apt., Toledo, Ohio, Acting Director, Public School Health Service, Board of Education  
 Wallace W. Schwabland, M.D., 317 County-City Bldg., Seattle, Wash., King County Health Officer  
 Kenneth C. Sheriff, M.D., Monterey County Hospital, Salinas, Calif., Monterey County Health Officer  
 Frank Ternocky, M.D., Bloomville, Ohio, Health Commissioner, Seneca County Dist.  
 Thomas McK. Thompson, M.D., M.P.H., 120 Front St., Philipsburg, Pa., Dist. Medical Officer, State Dept. of Health

### *Laboratory Section*

Edward S. Biddle, M.S., 29 E. Park Place, Newark, Del., Research Bacteriologist, Univ. of Delaware  
 William Burrows, Ph.D., Dept. of Bact., Univ.

of Chicago, Chicago, Ill., Asst. Professor of Bacteriology

Carl A. Frey, Ph.D., 54 Shannon Ave., Athens, Ohio, Professor of Bacteriology, Ohio Univ.  
 Stanley J. Gilmore, 634 N.E. 60th Ave., Portland, Ore., City Bacteriologist, Bureau of Health

John W. Williams, M.D., 10-424 Massachusetts Institute of Technology, Cambridge, Mass., Associate Professor of Public Health Laboratory Methods

### *Vital Statistics Section*

Huldah H. Ainsworth, Waterbury Hospital, Waterbury, Conn., Medical Records Librarian

Alberto E. Calvo-Sucre, M.P.H., P. O. Box 1158, Panama City, Republic of Panama, Chief, Division of Vital Statistics and Epidemiology

### *Engineering Section*

Anthony L. Bavone, Box 1268, Minot, N. D., Sanitary Engineer, Minot-Ward Health Unit  
 Harold A. Kemp, 1721 N. Huntington St., Arlington, Va., Head Engineer, Office, Chief of Engineers, U. S. Army

Z. H. Legg, Fayetteville, W. Va., Sanitarian, Fayette County Health Dept.

Robert J. Ollry, M.S.P.H., 348 Beacon St., Boston, Mass., Instructor in Biology, St. Lawrence Univ., Canton, N. Y.

William Samborski, M.S.P.H., 3919 John R. St., Detroit, Mich., Senior Sanitary Engineering Aid, City Dept. of Health

### *Industrial Hygiene Section*

Charles D. Bitting, 39 Hillside Ave., Kenil, N. J., Safety Supervisor, Hercules Powder Co.

### *Food and Nutrition Section*

Fred C. Baselt, 230 Park Ave., New York, N. Y., Manager of Research, Atlantic Division, American Can Co.

Philip R. Carter, D.V.M., 3736-47th Ave., South, Minneapolis, Minn., Veterinary Officer, Veterinary Corps, U. S. Army

Robena C. Carter, 700 South Beacon, Sedalia, Mo., Unit Supervisor, Housekeeping Aide Project, WPA

### *Maternal and Child Health Section*

Powell C. Carrel, D.D.S., M.P.H., 123 Argyle Ave., West Hartford, Conn., Chief, Div. of Dental Hygiene, State Dept. of Health

William W. Kelton, Jr., M.D., 707 W. 7th St.,

Austin, Tex., Director, Maternal & Child Health, Austin-Travis-Bastrop Health Unit  
 Elsie F. Norman, 311 Brush Creek, Kansas City, Mo., Dist. Supervisor, Child Protection Program, Works Projects Admin.  
 E. Bliss Pugsley, M.D., 245 Cooper St., Council House, Ottawa, Canada, Executive Asst., Div. of Maternal & Child Hygiene, The Canadian Welfare Council  
 Elihu L. Schuman, D.D.S., 171 Eastern Parkway, Brooklyn, N. Y., Dental Officer, U. S. Veterans' Admin.  
 Jess B. Spielholz, M.D., 506 Ft. Washington Ave., New York, N. Y., Clinic Pediatrician, New York City Dept. of Health

#### *Public Health Education*

Herbert Bauer, M.D., General Hospital, San Luis Obispo, Calif., San Luis Obispo County Physician  
 Jane L. Lyman, 228 Edwards St., New Haven, Conn., Student, Yale Univ. School of Public Health  
 Phyllis K. McCalmont, M.A., 519 Smithfield St., Pittsburgh, Pa., Executive Secretary, Child Health Div., General Health Council of Allegheny County  
 Roy L. Reinarz, 5010 Duval St., Austin, Tex., Sanitary Reserve, State Dept. of Health  
 Claire E. B. Reinhardt, M.Ed., C.P.H., 1551 Franklin Ave., Mineola, L. I., N. Y., Director of Education, Nassau County Cancer Committee  
 Kyle C. Rigsby, 100 N. 6th Ave., East, Cullman, Ala., Asst. in Health Education, Div. of Statistics and Reports, U. S. Public Health Service

#### *Public Health Nursing Section*

Margaret D. Arbuckle, Grantsville, W. Va., Public Health Nurse, State Health Dept.  
 H. Eleanor Johnson, Box 216, Williamsburg, Va., Chief Nurse, Peninsula Health Dist.  
 Ada Kruger, R.N., Lincoln County Health Dept., Hamlin, W. Va., Public Health Nurse  
 Freda M. LaKamp, Farm Bureau Bldg., Waterloo, Ill., County Nurse, Monroe County Nursing Service  
 Leah E. Miller, Health Dept., Lumberton, N. C., Public Health Nurse, U. S. Public Health Service  
 Emily G. Murray, R.N., P. O. Box 1118, Lufkin, Tex., Nurse, Angelina County Child Welfare Board  
 Ethel C. Ryckman, R.N., 39 North St., Hillsdale, Mich., Senior Counsellor, Hillsdale County Health Dept.  
 Elizabeth J. Smith, 351 Eighth Ave., N., Twin Falls, Ida., School Nurse, South Central Dist. Health Unit

#### *Epidemiology Section*

Harry H. Henderson, M.D., State Health Dept., Richmond, Va., State Epidemiologist  
 Ira D. Hirschy, M.D., 524 Linden St., Ann Arbor, Mich., Student, Univ. of Michigan, School of Public Health  
 Edward Kupka, M.D., 703 California State Bldg., Los Angeles, Calif., Chief, Bureau of Tuberculosis, State Dept. of Public Health  
 Joseph Py, D.O., 460 Lyceum Ave., Philadelphia, Pa., Head, Dept. of Preventive Medicine and Bacteriology, Philadelphia College of Osteopathy

#### *Unaffiliated*

Jean G. Ferguson, 428 Yale Ave., New Haven, Conn., Student and Asst. in Public Health Dept., Yale Univ.  
 Emil A. Tiboni, Greyledge Farm, R.F.D. 1, Glastonbury, Conn., Sanitary Inspector, Dept. of Health, East Hartford, Conn.

#### DECEASED MEMBERS

John N. Eisman, M.D., Cincinnati, Ohio, Elected Member 1941, Epidemiology Section  
 Howard W. Hassell, M.D., Bridgeport, Pa., Elected Member 1939, Health Officers Section  
 Harold H. Keller, Philadelphia, Pa., Elected Member 1932, Industrial Hygiene Section  
 J. P. Russell, M.D., Berkeley, Calif., Elected Member 1938, Elected Fellow 1940, Industrial Hygiene Section  
 A. N. Talbot, Urbana, Ill., Elected Member 1913, Charter Fellow 1922, Engineering Section  
 James D. Trask, M.D., New Haven, Conn., Elected Member 1936, Epidemiology Section  
 William H. Best, M.D., Brooklyn, N. Y., Elected Member 1936, Elected Fellow 1939, Health Officers Section  
 L. T. Clark, D.Sc., Detroit, Mich., Elected Member 1919, Elected Fellow 1931, Laboratory Section  
 Walter S. Goodale, M.D., Buffalo, N. Y., Elected Member 1923, Epidemiology Section  
 Abraham Lichterman, Ph.D., Brooklyn, N. Y., Elected Member 1935, Elected Fellow 1938, Food and Nutrition Section  
 Max P. Schranck, M.D., Twin Falls, Ida., Elected Member 1940, Industrial Hygiene Section  
 Winfield Carey Sweet, M.D., Dr.P.H., Lashie, Burma, India, Elected Member 1924, Epidemiology Section

## EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York, N. Y.

## U. S. CIVIL SERVICE COMMISSION

The Commission has announced unassembled examinations for Junior Public Health Nurse at \$1,800 a year and Junior Graduate Nurses at \$1,620 a year, under which the training and age requirements of announcements No. 88 and 103 of 1941 have been amended. Persons interested should communicate with the U. S. Civil Service Commission in Washington or obtain the amended announcements at any first or second class post office.

The Commission has announced again its need for public health nursing consultants in war work. The new announcement now provides for 5 grades and for appointments in the Children's Bureau, Department of Labor, U. S. Public Health Service, and Federal Security Agency. Salaries range from \$2,600 to 5,600 a year. No age limits have been set. Positions exist both in the United States and foreign countries. War service appointments will be made to extend generally for the duration of the war and no longer than 6 months afterward. Duties are to carry out, in accordance with the rank of the position, nursing or nursing education programs; and to act in advisory capacity to Federal agencies, or to State, County, and municipal organizations.

There will be no written test, qualifications being judged solely from review of experience, education, and training of applicants. Persons applying must have completed a 4 year course in a recognized college and 1 year's special program of study in public health nursing approved by the National Organization for Public Health Nursing; must also have graduated from an accredited school of nursing affiliated with a hospital having a daily average of 100 or more bed patients; be registered nurses in a state or territory of the United States or the District of Columbia, and have had appropriate general public health nursing supervisory experience. Additional credit given for completion of approved college course in statistical analysis, public health nursing, supervision, social hygiene, tuberculosis control and maternity, pediatric or orthopedic nursing; also for certain appropriate experience as instructor, consultant, or investigator.

For positions in Children's Bureau additional progressive experience in specialized fields of maternal or child health is required for the top grade and may be substituted for part of the general experience prescribed for the other grades.

Applications must be filed with the U. S. Civil Service Commission, Washington, D. C., and will be accepted until the needs of the service have been met. Forms may be obtained direct from the Commission or at any first or second class post office.

## PHYSICIANS NEEDED IN CANAL ZONE

The U. S. Civil Service Commission announces an examination to secure physicians for clinical service in the Panama Canal Zone. Graduation from a class A medical school subsequent to May 1, 1920, is required, and the applicant must be under 50. 25 to 35 years of age preferred. Entrance salary \$4,000. Persons interested should communicate with the U. S. Civil Service Commission, Washington.

## MERIT SYSTEM COUNCIL, OREGON STATE BOARD OF HEALTH AND CRIPPLED CHILDREN'S DIVISION, UNIVERSITY OF OREGON MEDICAL SCHOOL

have announced merit examinations in practically all professional public health fields, including Health Officers, Nurses, Sanitary Engineers, Laboratory Workers, Vital Statisticians, Consultants in the fields of Health Education, Hearing and Vision, Nutrition, Oral Health and Physiotherapy. Two clerical positions, Fiscal worker and Administrative Clerk are included in this list as is also the position of Merit System Personnel Technician.

Interested persons may get full particulars regarding the positions and examinations by writing H. J. Sears, Merit System Supervisor, P. O. Box 88, Portland, Ore.



The Indiana State Personnel Division, 141 South Meridian Street, Indianapolis, announces that applications may be filed at any time until further notice for the following positions:

Orthopedic Nursing Consultant I (women only).....	\$150-200 mo.
Physician I (General) .....	165-250 mo.
Physician II (General) .....	250-325 mo.
Physician II (Tuberculosis) .....	250-325 mo.
Physician I (Psychiatric) .....	185-265 mo.
Physician II (Psychiatric) .....	250-325 mo.
Local Public Health Director .....	300-360 mo.

### POSITIONS AVAILABLE

Physician with either public health training or experience in local health department administration to serve as health director in a county health department in mid-western state. Salary \$4,000 and \$500 travel (flat rate). Well established department with offices in attractive little city of 10,000. Write Box T, Employment Service, A.P.H.A.

Wanted: Trained Public Health Nurse, starting salary \$1,500 per year and traveling expense, increase to \$1,620 within 6 months. Saginaw County Health Dept., Saginaw, Mich.

Western state department of health will consider applications from physicians to fill four existing vacancies among county health officers, one vacancy in venereal disease control and positions as laboratory technicians. Write Box S, Employment Service, A.P.H.A.

County Public Health Nurses for New Mexico. Must have four months' post-graduate instruction under one of the recognized public health nursing courses and one year's experience. Must drive and have a car. Address inquiry to State Health Department, Santa Fe, N. M.

### PUBLIC HEALTH ENGINEER

Responsible professional public health engineering involving field investigations and office studies in the application of sanitary measures. The more difficult engineering and sanitation field surveys include supervision over public water supplies, sewerage systems and sewage treatment plants and review of plans for same, and promotion and supervision of sanitation programs. Minimum qualifications: Training and experience equivalent to 3 years' civil engineering experience, including 2 years in public health or sanitary engineering; or completion of an academic year of graduate study and a year's experience in sanitary or public health engineering; and graduation from a college of recognized standing with a major course in civil or sanitary engineering. The salary range is \$205 to \$250 per month depending upon experience. Apply Box E, Employment Service, A.P.H.A.

Southwestern state health department seeks 2 physicians for assignment to district health units, personally to conduct several small venereal disease clinics on a rotating schedule. Experience preferred but not required. Salary \$3,000, plus actual travel allowance not to exceed \$1,200. Write Box V, Employment Service, A.P.H.A.

The New Mexico State Department of Public Health will consider applications for the position of Assistant Director of the Maternal and Child Health Division. Address inquiries to the State Department of Public Health, Santa Fe, N. M.

Wanted: Trained Public Health Nurse, starting salary \$1,500 per year and traveling expenses. Increase may be expected within 6 months. Shiawassee County Health Department, Corunna, Mich.

Sanitarian Wanted: Starting salary \$1,800 per year with travel allowance of \$50 per month. Man must have his own car. Bachelor's degree followed by at least one year's course or its equivalent in subjects necessary for one entering the public health field, or an engineering degree plus one year's experience in sanitary or public health engineering required. A course in public health training may be considered as an equivalent for a part of the experience requirement. Apply Director District Department of Health No. 6, Central Office, Newberry, Mich.

Wanted: Nurse for county health work. Salary \$1,800 per year with travel allowance (additional) of \$500 per year. Address District Health Department 2, West Branch, Mich.

Instructor in Bacteriology, Medical School, large midwestern university, M.D. (or Ph.D. or D.Sc. in Bacteriology); Male. Salary \$1,800 to \$2,500 according to age and experience. Write Box D, Employment Service, A.P.H.A.

Bacteriologist with Ph.D. or equivalent and teaching experience wanted in western state university. Must be immune to military service call. Salary about \$2,500. Write Box A, Employment Service, A.P.H.A.

Laboratory technician wanted. Salary \$1,500. Apply Dr. R. G. Beachley, Direc-

tor of Health and Welfare, Arlington County Health Department, Arlington, Va.

## POSITIONS WANTED

### ADMINISTRATIVE

Teaching or administrative position desired by physician, aged 48. Experienced teacher in preventive medicine and public health, now employed at prominent medical school; 20 years' experience in municipal health administration and epidemiology. A-491

Physician, B.S., M.D., and M.S.P.H., University of Michigan, aged 35, experienced city-county health administration and as director university student health service. Will consider permanent responsible position offering good income. A-492

Physician with 25 years full-time experience in public health administration is available for immediate appointment. Moderately hard of hearing; otherwise fully able. Salary \$4,500 or better. A-497

Physician, M.D., C.P.H., aged 47, seeks position in administrative work. Experienced in venereal disease control and industrial medicine. A-485

Physician, aged 47, M.D. Creighton University, M.S.P.H. Michigan, experienced in school health and as director of county health unit, seeks position as administrator in state or local health department. A-498

Physician, aged 37, M.D., McGill, D.P.H., Toronto, experienced as health officer and director of public health training, seeks position in administrative work. A-499

### WOMEN PHYSICIANS TRAINED IN PUBLIC HEALTH

Woman aged 34, M.D., University of Basle, Switzerland, M.S.P.H. DeLamar Institute, Columbia University. U. S. citizen. Excellent references. Especially interested in industrial hygiene. A-493

Woman aged 41, M.D. Columbia University, M.S.P.H. DeLamar Institute, experienced in epidemiology and research, seeks position offering administrative experience. A-494

Woman physician, aged 48, M.D., University of Vienna. Excellent European pediatric experience. Seeks position in pediatrics, administration or statistical research. A-495

Woman physician, M.D., Rush, M.P.H., Michigan, 13 years' experience in school medical service and administrative county health unit, seeks administrative position. New York area preferred. A-500

### HEALTH EDUCATION

Health Educator, Negro, man with background of High School administration and M.S.P.H. from University of Michigan, seeks position in Health Education. Public agency or educational field. Excellent references. H-497

Health Educator, M.A. in Education, 10 years' background in community organization for public health education, also teaching of personal and community health at high school and college levels. Public health nurse, able to teach mental and social hygiene as well as general health education. East preferred. H-498

Teacher and research worker, man, Ph.D., age 52. Extensive record as college professor of biology and hygiene and investigator, for the past two years engaged in research. H-499

Woman, Sc.D., Johns Hopkins, M.S., Chicago. Chief interests health education, nutrition, biochemistry, 14 years' teaching experience in college, 7 years head of departments. Excellent recommendations. H-505

Health Educator. Man with M.S. in preventive medicine and public health. Negro. Seeks position in Health Education or field work with official or non-official agency. H-500

Woman with master's degree in health education, 12 years' successful experience in public school and college teaching, administration and research. Will consider position in normal school, public schools, or in official or nonofficial health agencies. Prefers South or East. Available at once. H-501

### LABORATORY

Milk Sanitarian and Technologist, age 37, Ph.D., Bacteriology, Wisconsin, 10 years' experience in milk and food sanitation from industrial and official angle, seeks administrative position with opportunity for research or investigational work preferred. L-381

Chemist, Sc.D., Biochemistry, Johns Hopkins University. Age 31. Public health laboratory experience, teaching experience. Desires position with promise of advancement, preferably in commercial organization. L-461

Bacteriologist, young man 28, with B.S. in industrial science, experienced in newspaper work, salesmanship and now employed in state department of health laboratory, seeks position as bacteriologist or doing promotional work of public health nature. L-465

#### MISCELLANEOUS

Veterinary Doctor, M.P.H., University of Pennsylvania, age 27, with two years

of practice, seeks position in food, meat, milk, or livestock sanitation with state or local health department. Also interested in teaching position with research facilities. M-451

Public Health Nurse with M.A. degree wishes position in health supervision and teaching in college or public school. West preferred. M-452

Administrative Assistant or Health Educator, woman, M.A. 10 years' experience in health agency offices; 7 years' teaching experience; writer on health and other subjects; experienced in independent research; some training in social work; some hospital experience. M-453

## NEWS FROM THE FIELD

### NEW YORK CITY CHANGES HEALTH COMMISSIONERS

MAYOR LAGUARDIA on July 16 announced the resignation, on account of ill health, of John L. Rice, M.D., who has been Commissioner of Health since January 1, 1934, and the appointment of Ernest L. Stebbins, M.D., M.P.H., Professor of Epidemiology at the DeLamar Institute of Public Health, Columbia University, New York, N. Y., as Commissioner, effective immediately. Dr. Rice will continue to serve the City as a special consultant.

Dr. Stebbins, who was born in Iowa in 1901, is a graduate of Dartmouth College, the Rush Medical College, Chicago, in 1929, and of Johns Hopkins University School of Hygiene and Public Health in 1932. He served as epidemiologist of the Virginia State Department of Health in 1931, and from 1932 to 1934 was Health Officer of Henrico County, Virginia. From 1934 to 1940 he was a staff member of the New York State Department of Health, serving as epidemiologist, district health officer, Director of the Division of Communicable Diseases, and Assistant Commissioner. Dr. Stebbins is Secretary of the Epidemiology Section of the American Public Health Association, and a member of the Governing Council.

### A.P.H.A. SURVEY IN ILLINOIS

UNDER the auspices of the Committee on Administrative Practice of the American Public Health Association and its Subcommittee on State Health Administration, a survey of public health administration in Illinois has been under way for several months. Carl E. Buck, Dr.P.H., Field Director of the committee, has been in charge of the study with the assistance of a local staff.

A progress report entitled "Public Health Needs in Illinois" is summarized by the *Illinois Health Messenger* as recommending the creation of a state-wide public health committee which should endeavor to develop a wide-spread popular understanding of the importance of state and local health departments so that politics may not interfere with the appointment or retention of properly qualified public health personnel and the plans for developing services. The report recommends that a public health building be provided to house the state department of public health. It is further recommended that the state construct and maintain one or more state tuberculosis sanatoria in those areas not adequately served by existing hospital facilities, and that a county sanatorium of about 2,000 beds be constructed in Cook County for patients outside of Chicago.

The progress report recommends that the State Department of Public Health in Illinois be given specific authority to control the installation and operation of all public water systems and that the department be authorized to require proof of competency from all operators of public water purification plants, sewage treatment works, and pasteurizing plants. Other recommendations are made by this progress report.

The work of organizing the recommended non-partisan State-wide Public Health Committee is already under way. Several local lay committees for public health education which have been functioning for some time in various sections of the state have already offered coöperation and eventually it is expected that these local groups will elect to affiliate with the larger organization.

The primary responsibility of the

Illinois State-wide Public Health Committee will be "to disseminate accurate information for the purpose of developing a widespread, intelligent lay understanding of existent public health problems, what is being done, and what can be done to solve them." Serving as Chairman of the committee is Frederic C. Woodward, Vice-President Emeritus of the University of Chicago, a man long known as a public spirited leader in civic affairs, a distinguished educator, and a lawyer of national reputation. Mr. Woodward is dividing the state into ten or twelve districts, for each of which he will later appoint a district chairman to facilitate committee operations. Eventually there are to be affiliates or subdivisions of the state-wide organization in every county.

In order that these groups may effectively define public health problems and suggest ways and means of meeting them, they will consult the state and local public health authorities. For this purpose the Illinois Director of Public Health, Dr. Roland R. Cross, has made available to Mr. Woodward the services of the personnel of the State Division of Public Health Instruction, under the direction of Mrs. Leona East, Chief.

#### HEALTH GAINS IN GREAT BRITAIN

A SUMMARY of a statement made by the British Minister of Health, Mr. Ernest Brown, before the House of Commons, was carried by *The New York Times* on July 1. According to the Minister of Health, Britain's health after almost three years of war was in many ways better than it has been, even despite an increase in tuberculosis and spinal meningitis. He stated that diphtheria was still the greatest killing disease of children between the ages of 4 and 10, and that diphtheria had killed more children last year than did German bombs.

Scarlet fever and typhoid fever had

become scourges of the past, the former claiming only 133 victims in 1941, and the latter 143 out of fewer than 5,000 cases. He said that the lack of serious typhoid fever epidemics after bombings was one thing which proved surprising to United States visitors but that no deaths during heavy bombings were caused by water-borne infection.

Confirming statements made by Sir Wilson Jameson, Chief Medical Officer of the Ministry of Health, before the American Public Health Association at the 1941 Annual Meeting, Mr. Brown said that there had been a drop in admissions to insane asylums. These had stood at 30,000 in 1938 and 1939 but dropped to 28,000 in 1940 and to 26,000 in 1941. Tuberculosis, he said, was giving the most trouble, probably because of blackout crowding and the cessation of house building. The nursing situation was unsatisfactory, particularly in the case of tuberculosis.

#### MERIT SYSTEM CONSULTATIONS

PROVISIONS will be made at the 71st Annual Meeting of the American Public Health Association in St. Louis, October 27-30, for consultations between those concerned with the administration of merit system plans and the staff of the Association conducting the Merit System Study under the auspices of the Committee on Professional Education. Appointments for consultation on this subject with Dorothy Deming, R.N., may be made through the Association office in the Auditorium.

#### LESLIE DANA GOLD MEDAL

THE Leslie Dana Gold Medal, awarded annually for outstanding achievements in the prevention of blindness and the conservation of vision, will be presented this year to Lewis H. Carris, Director Emeritus of the National Society for the Prevention of Blindness.

# PENNSYLVANIA PUBLIC HEALTH ASSOCIATION

THE Pennsylvania Public Health Association, under the Presidency of Lieutenant Colonel A. Parker Hitchens, M.C., met in Pittsburg on May 15 jointly with the Pennsylvania Association of Dairy Sanitarians and the Tri-State Food and Health Association. A resolution passed by the Pennsylvania Public Health Association (in abridged form) follows:

WHEREAS: The Pennsylvania Public Health Association, recognizing the importance to the public health and the public welfare of the dairy industries, at this particular period in our National History; and recognizing the fact that the dairy farmers, the processors and the distributors, and especially the consumers of dairy products, owe their greatest debt to sanitary science; and recognizing the commencement of the era of the scientific study and handling of milk and other dairy products in the bacteriological work initiated by Professor William T. Sedgwick, of Boston, Mass., and

WHEREAS: A painstaking review of the accomplishments of this Half Century of Milk Sanitation has revealed overwhelming evidence in support of the fact that no milk, however carefully each stage in its production is supervised, can be considered safe for human consumption unless it is collected in a cleanly manner, cooled quickly, pasteurized properly, adequately protected after pasteurization, and kept cold until its final utilization or preparation for use in the dietary, and

WHEREAS: the present needs of our country are causing everyone to explore the possibilities of curtailing the expenditure of time and materials to the limit of practicability and expediency, the public welfare demands that no procedure be authorized which may tend to reduce the consumption of wholesome, pasteurized milk; therefore be it

RESOLVED: that the Pennsylvania Public Health Association convened in this joint celebration\* of a Half Century of Milk Sanitation heartily acknowledges its debt to the pioneer work of William T. Sedgwick, to other scientists, and to all the various workers in agriculture and in industry who have contributed to our recognition of the value of milk in human nutrition and to the development of methods by which safe milk can be produced eco-

nomically and made universally available; and be it further

RESOLVED: that in recognition of the dangers of infection to which milk is constantly exposed, it is the considered opinion of these associations that only milk that has been properly pasteurized or boiled should ever be used for human nutrition; and, be it further . . .

RESOLVED: that any measure which may tend to curtail the availability of fresh and pasteurized milk is firmly opposed and the opinion is recorded that responsible officials should use every effort to prevent the adoption of any such measure or practice; and be it further

RESOLVED: that in promulgating these resolutions this Association is acting in accordance with its conviction that raw milk is always a potential carrier of dangerous infection and that now there is more reason than at any other period in our Nation's history to do everything possible to control preventable disease, and be it further

RESOLVED: that it is our considered opinion that *not to control disease is sabotage.*

## HEALTH EDUCATION IN MALARIA CONTROL

THE U. S. Public Health Service has recently initiated an interesting experiment in health education as a part of its program for malaria control in war areas. A local teacher has been employed for the summer in each of 25 counties in 7 southern states to organize the communities in and around war areas for health education in malaria control. The teachers were assembled in Memphis, Tenn., June 16-26, and given an intensive course on the essential facts of malaria control and methods of community organization for health education. After completing the orientation course, the teachers returned to their own counties and were assigned to the local health department as health educators. They will give particular attention to educating their communities in malaria control measures.

It is anticipated that the teachers will continue health education as a part of their regular activities in their respective schools during the coming year.

# ASSOCIATION OF FOOD AND DRUG OFFICIALS OF THE UNITED STATES

THE 46th annual conference of the Association of Food and Drug Officials of the United States was held at the Pennsylvania Hotel, New York, N. Y., June 1-5. The newly elected officials are as follows:

*President*—Sarah V. Dugan, Director, Bureau of Foods, Drugs and Hotels, State Department of Health, Louisville, Ky.

*Vice-President*—H. C. Lythgoe, Director, Division of Foods and Drugs, State Department of Health, Boston, Mass.

*Secretary-Treasurer*—J. C. Schneider, Chief, Bureau of Food and Drugs, State Board of Health, Indianapolis, Ind.

*Executive Committee*—W. A. Queen, U. S. Food and Drug Administration, Washington, D. C.; George Marsh, Director, Division of Agricultural Chemistry, State Department of Agriculture and Industries, Montgomery, Ala.; Jacob W. Forbes, Head, Food and Drug Section, State Department of Health, New Orleans, La.; William F. Reindollar (Chairman of the Editorial Committee), Chief, Bureau of Chemistry, State Department of Health, Baltimore, Md.

## INDUSTRIAL HYGIENE AND MEDICAL SERVICE IN THE WAR INDUSTRIES

IT has been announced by James G. Townsend, M.D., Chief of the Division of Industrial Hygiene, National Institute of Health, Bethesda, Md., that, on the request of the Committee on Industrial Medicine of the National Research Council, a manual is being prepared on the above subject intended for wide distribution among the medical profession. The general editor will be William M. Gafafer, Sc.D., Chief of the Statistical Unit of the Division of Industrial Hygiene, National Institute of Health.

The Committee on Industrial Medicine of the Division of Medical Sciences, National Research Council, has pointed out that the change-over of industry to the manufacture of war materials is resulting in modifications of occupational health hazards, the introduction of new occupational disease exposures

and certain variations in the industrial medical procedures. The following are illustrative:

1. There is increased usage of cutting oils, compounds, and chemicals, many of which are capable of causing the industrial dermatoses.

2. Grinding operations have multiplied and these entail exposures to aluminum oxide, silicon carbide, and other grinding materials. While the dusts from grinding operations have not been regarded as harmful to health, disabilities occurring in workers so exposed are coming to be regarded as compensable.

3. Shot blast operations are being replaced by sand blasting, and new installations of this nature are consistently using sand.

4. In an effort to speed up pickling operations, there is a tendency to increase the concentrations of acids in the pickling tanks, with consequently more contamination of the air with fine droplets of the acids.

5. Solvents are being more widely used and certain of the newer ones are purported to be non-toxic. Inasmuch as most of them are in the chlorinated hydrocarbon group of chemicals, they can be assumed to be more or less toxic.

6. Paint spraying operations are being modified, requiring radical readjustments in ventilation procedures.

7. There is a tendency toward longer working hours and, consequently, longer hours of exposure to harmful materials and shorter periods of recuperation.

8. It is becoming more and more necessary to employ women, older men, and young men who are not eligible for military service, many of whom require selective placement, which is a function of the plant medical service.

9. It is necessary that the medical service in the war industries be integrated with the emergency medical service of civilian defense. Details necessary to this objective are not understood by the industrial physicians as yet.

## PHYSICAL THERAPY COURSE AT COLUMBIA UNIVERSITY

COLUMBIA University announces that beginning September, 1942, a program of professional studies for the training of Physical Therapy technicians will be offered. This training and instruction will extend over a two year period, and has been organized in compliance with the requirements set

down for such programs by the Council of Medical Education and Hospitals of the American Medical Association. The course is being set up in University Extension in close relationship with the College of Physicians and Surgeons of Columbia University, and the Nursing, Education and Health, and Physical Education Departments of Teachers College. The clinical and laboratory instruction will be given at the Vanderbilt Clinic, Neurological Institute, Presbyterian Hospital, and New York Orthopedic Dispensary and Hospital.

Two years or 60 semester hours of college, including courses in Physics and Biology, shall be required, or graduation from an accredited School of Nursing or an accredited School of Physical Education.

A Certificate of Proficiency in Physical Therapy will be granted by Columbia University to those completing the course. Further information may be obtained by writing the Office of the Committee on Physical Therapy, Room 303 B, School of Business, Columbia University, New York, N. Y.

#### SURVEY OF CONNECTICUT HOUSING

THE Committee on the Hygiene of Housing of the American Public Health Association has published the results of test surveys of housing conditions in slum and low-rent areas, conducted in three Connecticut cities. These studies were made with the appraisal technic developed by the committee as a guide to housing inspection and enforcement by local health departments.

The committee's report, published in the February 27 and April 3, 1942, issues of *Public Health Reports*, shows that the method used for rating the quality of housing provides a clear discrimination between adequate and substandard dwellings, and also that it furnishes specific guidance for remedial

measures by enforcement agencies. Reprints of the report are available on request from the Committee on the Hygiene of Housing, 310 Cedar Street, New Haven, Conn.

This appraisal technic has been officially adopted for a demonstration survey in a large district of slums and blighted areas of New Haven, Conn., which is now being conducted under the joint sponsorship of the local health department, housing authority, and city plan commission, the Connecticut Department of Health, and the Committee on the Hygiene of Housing. It is the purpose of the coöperating agencies to develop a comprehensive and integrated official program of housing enforcement, rehabilitation and reconstruction for the problem areas covered by the survey, and to stimulate the extension of such coöperative studies to other portions of New Haven and to other cities.

#### A.M.A. RESOLUTION

AT the recent meeting of the American Medical Association in Atlantic City, the Section on Preventive and Industrial Medicine and Public Health adopted a resolution, which was later presented and adopted by the House of Delegates, relating to the health protection of the civil population. The resolution follows:

WHEREAS a major factor in the inadequate health protection of the civil population of the nation in peace and war time is the failure to provide for each population unit and each area of jurisdiction, whether city, county, or district, with a full-time, trained health officer and necessary accessory personnel on a merit basis and supported by sufficient local tax resources supplemented by state and, where required, by federal funds, therefore be it

RESOLVED that the Section on Preventive and Industrial Medicine and Public Health urge the Trustees of the American Medical Association to obtain a complete coverage of the population and the area of the United States with full-time, trained health services at the earliest practicable date.



## DELAWARE PUBLIC HEALTH ASSOCIATION

THE Delaware Public Health Association held its first annual meeting in Wilmington, Del., June 5, with over 100 in attendance at the all-day sessions. The association is planned as a further step in coöperation between state health and welfare workers and the officers represent five different organizations and the membership seventeen groups.

*President*—Edwin Cameron, M.D., Executive Secretary, State Board of Health

*First Vice-President*—G. H. Gehrman, M.D., Medical Director, duPont Company

*Second Vice-President*—Anna VanW. Castle, Head of the Visiting Nurses Association

*Secretary*—G. Taggart Evans, Executive Secretary, Delaware Anti-Tuberculosis Society

*Treasurer*—Roger Murray, M.D., former head of the Wilmington Board of Health

Speakers at the annual meeting included Dr. R. C. Williams, Senior Surgeon, U. S. Public Health Service; Lt. Col. A. G. Compton, M.C., of Fort duPont; Charlotte Heilmann, a representative of the North Atlantic Area of the American Red Cross; Ethelda B. Mullin, Executive Secretary of the Wilmington Family Society; and Richard C. Beckett, sanitary engineer for the Delaware State Board of Health.

## NATIONAL HEALTH LIBRARY

THE National Health Library at 1790 Broadway, New York, N. Y., is maintaining a card file of magazine references on health, national defense and war. The file is subdivided under general headings such as child welfare, civilian health, industrial hygiene, mental hygiene, nutrition, social hygiene, tuberculosis, etc. At present there are over a thousand entries and additions are made daily. So far there have been reproduced for distribution five lists of references in relation to child welfare, civilians' mental and physical health, industrial hygiene, nutrition and tuberculosis. A limited supply of these lists is available for distribution on request.

## A. M. A. EXHIBITS

THE American Medical Association at its 93rd meeting in Atlantic City, N. J., awarded gold medals in the exhibit to Dr. John C. Bugher and Manual Roca-Garcia of the National Department of Health, Bogota, Columbia, for their exhibit on the means by which jungle fever is spread by mosquitoes.

Special certificates of appreciation were awarded to eleven exhibits from Latin-American republics. There were also a number of certificates of merit and a special certificate of merit given to demonstrations of the Kenny method for the treatment of infantile paralysis.

## DRINKING FOUNTAIN STANDARD

THE American Standards Association, New York, N. Y., has announced that new American Standard Specifications for Drinking Fountains (Z4.2-1942) have been adopted by the American Standards Association as of January 14, 1942 (supersedes Z4.2-1935).

The new standard was revised at the suggestion of the Committee on Research and Standards of the American Public Health Association and is essentially identical with the A.P.H.A. standard published in the 1933-1934 *Year Book*, pages 82-83, as the Appendix of the report of the Committee on Plumbing of the Engineering Section.

## NEW PUBLIC HEALTH NURSING CURRICULA

THE curriculum in Public Health Nursing in the School of Public Health, The University of North Carolina, Chapel Hill, is now on the accredited list of the National Organization for Public Health Nursing of programs of study in Public Health Nursing for graduate nurses, as are also the curricula at Seton Hall College, Newark, N. J., and the University of Pittsburgh, Pittsburgh, Pa.

13TH ANNUAL MEETING  
WESTERN BRANCH, A.P.H.A.

SEATTLE, Wash., was the scene of the 13th Annual Meeting of the Western Branch and related groups, May 26-29. A strong local community under the Chairmanship of Honoria Hughes, with the active support of Dr. Donald G. Evans, Washington State Health Officer, and his staff, provided an excellent physical setting, and a Program Committee under the Chairmanship of Dr. Adolph Weinzirl, Portland, Ore., provided features of outstanding quality. The Western Branch, under the Presidency of Dr. John J. Sippy of California, and under the leadership of W. Ford Higby of San Francisco, had a good year.

The first day provided conferences of state supervisory nurses, of workers in maternal and child health and crippled children's services, in social hygiene, in vital statistics, and in various aspects of the Indian Service.

Unusually representative participation was secured from outside the territory of the Western Branch. The address of Dr. Harry S. Mustard, Director of the DeLamar Institute of Public Health, Columbia University, New York, N. Y., on "The Need for More Adequate Public Health Programs" will be remembered by many in attendance. It will be published in an early issue of the *Journal*. Dr. Albert McCown, Medical Director of the American National Red Cross, Washington, D. C., Dr. George Baehr, Chief Medical Officer of the Office of Civilian Defense, Washington, D. C., Dr. Kenneth F. Maxcy, Professor of Epidemiology, Johns Hopkins University School of Hygiene and Public Health, Baltimore, Marjorie M. Heseltine, Children's Bureau, Washington, Dr. James G. Townsend of the National Institute of Health, Bethesda, Md., Dr. Orlen J. Johnson of the American Medical As-

sociation staff, Dr. Mark V. Ziegler of the U. S. Public Health Service, Chicago, Mary J. Dunn, U. S. Public Health Service, Washington, Dr. Edwin F. Daily, Children's Bureau, Washington, and Dr. Reginald M. Atwater, Executive Secretary of the American Public Health Association, were among participants from other parts of the country, in addition to more than 600 in attendance from the western states and provinces, the Territory of Alaska and other parts of the Western Branch area.

PUBLIC HEALTH RESEARCH INSTITUTE  
OF NEW YORK CITY

THE City of New York, on July 1, entered into a contract said to be unique in municipal history with the Public Health Research Institute of the City of New York, Inc., a recently formed, non-profit, scientific institution. The contract is in force for a period of ten years and is automatically renewable for similar periods unless previously abrogated, and provides for the payment by the city to the Institute of \$100,000 annually. The money is to be used by the Institute to carry on fundamental medical research through a staff of competent scientists under the direction of a research council composed of leading authorities in the field of medicine, biology, physiology, nutrition, public health and related fields.

The services to be rendered by the Institute to the City include research and investigation into the control of diseases such as influenza, poliomyelitis, arthritis, degenerative diseases and general physiological problems such as nutrition. Also generally to engage in laboratory experimentation and research in order to develop better and more economical biological products and improve technical procedures for use in combating diseases in epidemics. The Institute will assist the director of the Bureau of Laboratories of the Depart-

ment of Health in matters involving public health research. The City on its part agrees to permit the Institute to use premises now occupied by the Bureau of Laboratories of the Department of Health at the William Hallock Park Laboratory or elsewhere without charge. The results of the Institute's research are to be the property of the City and any discovery of products or methods which may be made by anyone employed by the Institute will belong to the City as soon as made and there will be no further compensation. All patents issued to the Institute or to any of its employees shall be assigned immediately to the City. Unless the City notifies the Institute not less than one year prior to the termination date of this agreement, it will automatically renew itself on June 30, 1952, for a period of ten years.

The Board of Directors of the Institute includes David Heyman, President of the New York Foundation, the Mayor of New York, the Comptroller, Commissioner of Health Dr. John L. Rice, David Rockefeller as vice-president, Edwin F. Chinlund, treasurer, and David Morse, secretary. The research council in charge of all scientific programs is under the chairmanship of Dr. Thomas M. Rivers, director of the hospital of the Rockefeller Institute for Medical Research, New York, now of the Navy Medical Reserve Corps, and Drs. Eugene L. Opie, Henry C. Sherman, George Baehr, Michael Heidelberger and Ralph S. Muckenfuss, Director of the Bureau of Laboratories, New York City Department of Health.

#### NURSING PERSONNEL POLICIES AND SALARIES

IT has been announced by Alma C. Haupt, R.N., Executive Secretary of the Subcommittee on Nursing of the Office of Defense, Health and Welfare Services, Washington, that, at a recent meeting the Subcommittees on Nursing

and Hospitals, impressed by the shortage of nurses and the increasing needs of the army and navy for additional personnel throughout this year and next, felt that the shortage of graduate nursing personnel in civilian institutions was, in many instances, largely due to personnel policies and salaries.

The committees adopted a resolution calling to the attention of hospital authorities the revised *Manual of the Essentials of Good Hospital Nursing Service*, published by the American Hospital Association and the National League of Nursing Education, with the urgent request that the personnel policies therein be thoughtfully reviewed in relation to the policies effective in institutions under their control in order that graduate nurses may be encouraged to remain in institutional service rather than going into non-nursing work, and that a large number of qualified young women may be attracted to enter schools of nursing.

#### CLEVELAND FOUNDATION GRANT

SUPPORTING the Cleveland Health Museum in its program to "go to the people" when tire and gasoline shortages prevent people from coming to the museum, the Cleveland Foundation has made a grant which will be used for assisting in construction and installation of health exhibits throughout Greater Cleveland.

Dr. Bruno Gebhard, museum director, suggested that groups interested in obtaining neighborhood exhibits consult the museum. He reported that requests for the "Food for Health" traveling display have become so numerous that duplicates are being constructed.

#### HANDBOOK OF SCIENTIFIC AND TECHNICAL SOCIETIES

THE National Research Council has announced publication of the 4th edition of the *Handbook of Scientific*

and Technical Societies and Institutions in the United States and Canada. The United States section contains information on 1,269 societies, associations and similar organizations in the natural sciences and related fields contributing to the advancement of knowledge through their meetings, publications and other resources. The Canadian section contains information concerning 143 organizations.

Copies of the *Handbook* can be obtained through the Book Service of the American Public Health Association at the list price of \$4.00.

#### HERMAN KIEFER HOSPITAL STAFF CHANGES

**A**PPPOINTMENTS were recently made of G. R. Harris, formerly Superintendent of Public Welfare for the City of Detroit, as Hospital Administrator of the Herman Kiefer Hospital; and Franklin H. Top, M.D., as Medical Director. Dr. Top retains his former position as Director of the Division of Communicable Diseases and Epidemiology of the Detroit Department of Health and of the Herman Keifer Hospital.

#### PERSONALS

##### Central States

**RICHARD F. BOYD, M.D.,†** recently Assistant to the Chief of the Division of Local Health Administration, Illinois Department of Public Health, Springfield, has been appointed Acting Chief of the Division, succeeding **MARVIN F. HAYGOOD, M.D., C.P.H.,†** deceased, who was to have become Chief of the Division of Local Health Administration on July 1. Dr. Haygood had recently resigned as a staff member of the Iowa State Department of Health, Des Moines.

**DONALD E. BUX, M.D.,** of Manhattan, Kans., has been appointed full-time Health Officer of Cherokee County, with offices in Columbus, succeeding

**JOSEPH W. SPEARING, M.D.,†** who resigned to become Medical Director of the Kansas Ordnance Plant at Parsons.

**JOHN A. CARSWELL, M.D., D.P.H.,†** has resigned as Deputy Commissioner of Health in the Peoria, Ill., Department of Health, to accept a position as Commissioner of Health, Santa Barbara County Department of Health, Santa Barbara, Calif. He is succeeded in Peoria by **H. V. HULLERMAN, M.D.†**

**WILLIAM H. CARY, JR.,\*** has been appointed as Sanitary Engineer (R), U. S. Public Health Service, and as Regional Engineer in the Office of Civilian Defense, Sixth Region, Chicago, Ill. He formerly served with the Department of Health, Detroit, Mich., as Sanitary Engineer.

**WILLIAM C. GIBSON†** was recently appointed a First Lieutenant in the Sanitary Corps of the U. S. Army, with orders to active duty at Key Field, Miss. He will be on leave of absence from his position as Sanitary Engineer of the Hillsdale County Health Department, Hillsdale, Mich., and the W. K. Kellogg Foundation, for the duration of the war.

**JACQUES P. GRAY, M.D., M.P.H.,\*** former Health Director of Hillsdale County, a unit of the Michigan Community Health Project of the W. K. Kellogg Foundation, resigned July 1, to assume the position of Professor of Public Health and Preventive Medicine and Dean of the Medical College of Virginia, effective July 1.

**A. L. MILLER, M.D.,†** Nebraska State Health Director, Lincoln, has announced his candidacy for the Republican nomination to Congress. According to the press, Dr. Miller has stated that he would resign his position to devote full time to his campaign.

\* Fellow A.P.H.A.

† Member A.P.H.A.

GEORGE F. MOENCH, M.D.,† has been appointed County Health Director, Hillsdale County Health Department, Hillsdale, Mich. He assumed his position in Hillsdale June 15, following a 5 months' experience as Acting Health Director for Calhoun County occasioned by the sabbatical leave of HUGH B. ROBINS, M.D.,† who has been health director for Calhoun County for the past 5 years.

CLARENCE D. SELBY, M.D.,\* of Detroit, Mich., Medical Consultant with the General Motors Corporation, has been awarded the W. S. Knudsen Award of the American Association for Industrial Physicians and Surgeons in recognition for his "most outstanding contribution to industrial medicine."

#### Eastern States

ROBERT S. BREED, Ph.D.,\* Geneva, N. Y., Chairman of the Standard Methods Committee for the Examination of Dairy Products of the Laboratory Section, A.P.H.A., left early in July for Mexico City, to attend a conference on the means of increasing production of needed agricultural products in the Americas. This is the second trip which Dr. Breed has made to Mexico during the current year.

ROSABEL BURCH,† formerly on the staff of the National Office, Girl Scouts, Inc., New York, N. Y., has accepted a position with the Federal Security Agency, Office of Defense Health and Welfare Services, and is located at the Regional Office at 120 Boylston Street, Boston, Mass.

FRANCIS B. CARROLL, M.D., M.P.H., D.M.D.,† is on leave of absence from his position as State District Health Officer, Massachusetts Department of Public Health. He was called on active duty with the Medical Corps

of the U. S. Army on August 1, 1941, and was assigned to the 16th Medical Regiment at Fort Devens, Mass. On February 10, 1942, he was transferred to Fort Knox, Ky., and assigned, under the authority of the Department of Preventive Medicine, of the Surgeon General's Office, as Camp Epidemiologist at Fort Knox.

DR. GEORGE FRAUENBERGER is now Director of the Division of Physically Handicapped Children, of the Department of Health of the City of New York. This position was formerly held by DR. LYMAN C. DURYEA and by DR. VERNON LIP-PARD. As of the 1st of July, this Division became known as the Division of Physically Handicapped Children instead of Division of Crippled Children, the area of responsibility having been widened to include cardiac as well as orthopedically handicapped children. Dr. Frauenberger was formerly Director of Clinics at the Children's Hospital in Philadelphia, Pa., and has had a wide experience in pediatrics, child growth and development.

VLADO A. GETTING, M.D., Dr.P.H.,† of Boston, Mass., recently District Health Officer with the Massachusetts Department of Public Health, has been appointed Commissioner of Health of Worcester, and entered upon his new duties in February. He succeeded PETER O. SHEA, M.D.,† deceased.

IRA V. HISCOCK, Sc.D.,\* of New Haven, Conn., who is serving a third five year term of office as member of the Board of Health Commissioners of New Haven, was recently elected President of the Board of Health Commissioners.

ERNEST B. HOWARD, M.D., M.P.H.,† of Boston, Director of the Division of Genito-Infectious Diseases of the Massachusetts Department of Public Health, has been commissioned in the

\* Fellow A.P.H.A.

† Member A.P.H.A.

Medical Corps of the U. S. Army and assigned as venereal disease control officer with the Fourth Corps Area headquarters in Atlanta, Ga.

PETER C. KARELEKAS, of Springfield, Mass., Junior Sanitary Engineer from the Massachusetts Department of Public Health, has been commissioned in the Sanitary Corps of the U. S. Army.

ELLIOT S. ROBINSON, M.D., PH.D.,\* of Newton, Mass., Director of the Division of Biologic Laboratories of the Massachusetts Department of Public Health, has been commissioned in the Medical Corps of the U. S. Army with the rank of lieutenant-colonel, and is in charge of army laboratory services in the office of the Surgeon General. GEOFFREY EDSALL, M.D.,† of Cambridge, formerly Assistant Director under Dr. Robinson, has been named Acting Director.

CLARENCE I. STERLING, JR., of Westfield, Mass., Assistant Sanitary Engineer from the Massachusetts Department of Public Health, has taken leave of absence to join the staff of the Office of Coördinator of Inter-American Affairs in the Division of Health and Sanitation, under the direction of Brigadier-General GEORGE C. DUNHAM, M.D., DR.P.H.\* He has been assigned to Asuncion, Paraguay.

FREDERICK J. VINTINNER,† Director of the Division of Industrial Hygiene of the New Hampshire State Board of Health, Concord, left early in July for Army service at a post in Arkansas.

MYRON E. WEGMAN, M.D.,† recently of the School of Tropical Medicine, San Juan, Puerto Rico, has been appointed Director of Training in the Bureau of Child Hygiene of the Department of Health of the City of New York. Dr. Wegman will also

be connected with the Cornell University Medical College and the DeLamar Institute of Public Health, and his duties will be to provide not only for in-service training of departmental employees but he will have much to do with the training of volunteers in child care work. The last incumbent of this position was ALBERT C. McCOWN, M.D.†

C.-E. A. WINSLOW, DR.P.H.,\* Anna R. Lauder Professor of Public Health, Yale University, New Haven, Conn., has been elected President of the National Association of Housing Officials, Chicago. Professor Winslow is Chairman of the Committee on the Hygiene of Housing of the American Public Health Association. C.-E. A. WINSLOW, DR.P.H.,\* Anna R. Lauder Professor of Public Health, Yale University, New Haven, Conn., has been designated by the Royal Sanitary Institute of Great Britain as representative of the Institute at the 71st Annual Meeting of the American Public Health Association in St. Louis next October 27-30.

#### Southern States

CHARLES ARMSTRONG, M.D., Sc.D.,\* Senior Surgeon of the U. S. Public Health Service, and Director of the Division of Infectious Diseases of the National Institute of Health, Bethesda, Md., is convalescing at Hamilton, Mont., from a severe attack of tularemia, as announced by *Science*. He was taken ill on May 25, a few hours after his arrival on an official visit to the Rocky Mountain Spotted Fever Laboratory at Hamilton.

DR. JOHN Y. BATTENFIELD, serving for several months with a special trachoma project in Oklahoma under the joint auspices of The National Society for the Prevention of Blindness, Inc., and the Oklahoma State Health Department, has been ap-

\* Fellow A.P.H.A.

† Member A.P.H.A.

pointed Medical Associate of the Society, in New York, N. Y. Dr. Bat-tenfield was formerly Epidemiologist and Director of the Division of Preventable Diseases in the Oklahoma State Health Department, and he is President of the Oklahoma Public Health Association.

W. V. BESSONETTE, M.D.,<sup>†</sup> formerly Director of the Texarkana-Bowie County Health Unit, Texarkana, Tex., is now Director of the Palo Pinto-Parker Bi-county Unit.

LIEUT. EVAN C. BOURDON (M.C.),<sup>†</sup> Director of the Uvalde-Zavala-Kinney Health Unit, Uvalde, Tex., has been called into military service.

DEAN A. CLARK, M.D., Surgeon in the Division of Public Health Methods of the National Institute of Health, U. S. Public Health Service, Bethesda, Md., has been appointed as head of a Hospital Section organized to carry out the new program, recently announced by the OCD and the Federal Security Agency. Dr. Clark will also head a new Emergency Medical Section in the Public Health Service which will administer the program jointly with the Medical Division.

HESTER CURTIS, M.D., M.P.H., recently resigned as Director of the Division of Maternal and Child Hygiene, of the West Virginia State Health Department, to become Regional Consultant in the Children's Bureau, Washington.

DR. B. H. ESTESS, formerly of the Jasper-Newton County Health Unit, has been made Director of the Central Texas Health Department with offices at Belton, Tex. Dr. R. S. LLOYD replaces Dr. Estess in the Jasper-Newton County Health Unit.

GEORGE A. GRAY, M.D.,<sup>‡</sup> for the past year President of the Texas Public Health Association and Director of

the Abilene-Taylor County Health Unit, Abilene, Tex., has been called into military service.

HERBERT HARGIS, recently returned from a year's leave of absence, during which he was assigned by the Pan American Sanitary Bureau to Bolivia, reported recently to the Austin-Travis County Health Unit, Austin, Tex., as Sanitary Engineer.

DR. PHILIP M. HAUSER, formerly Assistant Chief Statistician for Population in the Bureau of the Census, Washington, D. C., has been announced as Assistant Director of the Bureau, by Director J. C. Capt of the Bureau, effective July 1. Dr. Hauser will be in charge of social statistics, including population and housing statistics, vital statistics, the census of agriculture, and statistics relating to state and local government.

DR. LEE JANIS, of the U. S. Public Health Service, has assumed the directorship of the Texarkana-Bowie County Health Unit, Texas.

ALAN C. LOVE, M.S.,<sup>‡</sup> for the past 3 years Sanitary Engineer with the Austin-Travis County Health Unit, Austin, Tex., has transferred to Waco with the new McClennan County Health Unit.

DR. EARL C. NORMAN, now Major Norman, formerly of the Uvalde-Zavala Health Unit, Uvalde, Tex., is now located in Bermuda.

THOMAS PARRAN, M.D.,\* Surgeon General of the U. S. Public Health Service, Washington, D. C., was among those receiving honorary degrees at the 176th Commencement of Rutgers University, New Brunswick, N. J.

DR. W. B. PROTHRO, M.D.,<sup>‡</sup> has assumed direction of the El Paso-Hudspeth County Health Unit, El Paso, Tex., replacing Dr. L. T. Cox, now in the U. S. Navy. Dr. Prothro is a brother of E. W. PROTHRO, M.D.,<sup>‡</sup> Director of the Corpus

\* Fellow A.P.H.A.

† Member A.P.H.A.

Christi-Nueces County Health Unit, Corpus Christi, Tex., and is a graduate in public health from Johns Hopkins University.

GEORGE E. RILEY, M.D., of Jackson, Miss., has been named Health Officer of Clay County, with offices in West Point, Miss.

HORACE M. ROBERSON, M.D.,† Health Director for Bledsoe and Sequatchie Counties, Tennessee, has been named to a similar position in Rhea and Meigs Counties, succeeding HOLLIS C. MILES, M.D.,† of Dayton, who resigned to return to private practice in Cincinnati.

VAN C. TIPTON, M.D.,† formerly Director of the San Antonio City Health Department, San Antonio, Tex., and Field Director of the Division of Maternal and Child Health, is now Lieutenant Commander, stationed in Washington, D. C., with the Division of Communicable Diseases of the Bureau of Medicine and Surgery of the Navy.

#### Western States

DAVID D. CARR, M.D., C.P.H.,\* recently of the Utah State Board of Health staff, Salt Lake City, Utah, has accepted the position of City Health Officer in Topeka, Kans.

W. V. CRUESS, Ph.D.,† of the fruit products laboratory, College of Agriculture of the University of California, has been awarded the first Nicholas Appert Medal for outstanding contributions to the development of improved food preservation methods, by the Institute of Food Technologists at its recent meeting in Minneapolis.

J. EDWARD DEHNE, M.D.,† of Coquille, Ore., Health Officer of Coos County, has been ordered to active duty with the Army.

VERNON A. DOUGLAS, M.D.,† of Salem,

Ore., Health Officer of Marion County, has been appointed Medical Officer for the Oregon State Defense Council.

ROBERT S. HAMILTON, M.D., has been appointed Health Officer of Clallam County and the city of Port Angeles, Wash., succeeding ALFRED E. EYRES, M.D.,† who recently resigned to take additional work in public health.

ROBERT T. LEGGE, M.D.,† Professor of Hygiene, and Chairman of the Department of Hygiene at the University of California at Berkeley, Calif., retires as Professor Emeritus after 28 years of service. Dr. Legge also was University Physician and Medical Director for the Cowell Memorial Hospital for a quarter of a century.

FRANK MARION MELTON, M.D., of Brandenburg, has been appointed Health Officer for the Unit in Oldham County, Ky.

KARL F. MEYER, Ph.D., M.D.,\* Director of the Hooper Foundation of the University of California, San Francisco, has been appointed a member of the Medical and Health Advisory Committee of the American Red Cross.

A. V. NASATIR, M.D., C.P.H.,† formerly Director of the Division of Industrial Hygiene, Los Angeles City Health Department, Los Angeles, Calif., is now a Captain in the Industrial Hygiene Service of the Medical Corps in the U. S. Army. Dr. Nasatir is in charge of the medical program of industrial plants at Ogden, Utah.

MARTHA SHAMBERGER, B.S., M.P.H.,† who recently has completed her work at Yale University, has been appointed as a field worker with the Oregon Tuberculosis Association, Portland, with interests specializing in the field of statistics and public information.

ELMER S. TENNEY, M.D., DR.P.H. (Major, U. S. Army, Retired),† for nearly 7 years Deputy Health Officer

\* Fellow A.P.H.A.

† Member A.P.H.A.



of Berkeley, Calif., resigned this position March 31.

### Hawaii

PHILIP S. PLATT, PH.D., C.P.H.,\* formerly Director, Palama Settlement, Honolulu, Hawaii, has been appointed Associate Director of the Committee on Voluntary Health Agencies, National Health Council, New York, N. Y., of which SELSKAR M. GUNN\* is Director. Previous to his service in Hawaii, Dr. Platt was Assistant Director of the New York Tuberculosis and Health Association, and previously Associate Director of the Research Division of the American Child Health Association. He began his new work on July 1.

### DEATHS

HENRY DWIGHT CHAPIN, M.D., Professor Emeritus of Children's Diseases at the New York Post-Graduate Medical School and Hospital, died June 27, at the age of 85.

LAWRENCE T. CLARK, Sc.D.,\* Director

\* Fellow A.P.H.A.

† Member A.P.H.A.

of the Biological Laboratories of Parke, Davis and Company, Detroit, Mich., died recently. According to the newspaper account, Dr. Clark was hit by a falling tree in a thunder storm at his country home near Howell, Mich., on May 29.

ABRAHAM LICHTERMAN, PHAR.D., of New York, N. Y., died recently.

ROY K. FLANNAGAN, M.D.,† Medical Director of the Department of Public Health of Virginia, Richmond, died June 18.

MARVIN F. HAYGOOD, M.D., C.P.H.,† Des Moines, Ia., died recently. He was to have become Chief of the Division of Local Health Administration of the Illinois State Department of Public Health on July 1.

DR. LARKIN E. STARK, Dental Consultant of the Texas State Department of Health, died on May 19, at his home in El Paso.

HENRY GOTTLIEB STEINMETZ, M.D.,† Assistant Director of the Venereal Division, Michigan Department of Health, Lansing, Mich., died on April 22, of anesthetic shock, at the age of 45.

## CONFERENCES AND DATES

American Association for the Advancement of Science. New York, N. Y. December 28-January 2.

American Chemical Society—National Chemical Exposition, National Industrial Chemical Conference. Stevens Hotel, Chicago, Ill. November 17-22.

American College of Surgeons—Clinical Congress. 32nd Annual. The 25th Annual Hospital Standardization Conference, sponsored by the College, will be held simultaneously. Stevens Hotel, Chicago, Ill. October 19-23.

American Congress of Physical Therapy—21st Annual Scientific and Clinical Session. Hotel William Penn, Pittsburgh, Pa. September 9-12.

American Hospital Association. St. Louis, Mo. October 12-16.

American Library Association—Midwinter

Conference. Chicago, Ill. December 28-31.

American Public Health Association—71st Annual Meeting. Headquarters, Municipal Auditorium, St. Louis, Mo. October 27-30.

American Public Works Association. Cleveland, Ohio. October 18-21.

American Society for Public Administration. Chicago, Ill. December 27-28 (tentative).

American Society of Civil Engineers—Fall Meeting. New England. October.

American Water Works Association—Michigan Section—Park Place Hotel, Traverse City, Mich. September 9-11.

Rocky Mountain Section—Frontier Hotel, Cheyenne, Wyo. September 17-18.

Western Pennsylvania Section—Roosevelt Hotel, Pittsburgh, Pa. September 18.

Minnesota Section—Lowrey Hotel, St. Paul, Minn. September 24-26.

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## Epidemiological Observations in the Halifax Epidemic\*

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Health, Halifax, Nova Scotia*

REPORTS of individual epidemics are apt to have little importance as epidemiological contributions unless certain features of the epidemic can be considered in terms of the general behavior of the disease being studied. Unusual opportunities were present in Halifax in the winter of 1940-1941 to study a simultaneous outbreak of *gravis* diphtheria, scarlet fever, and meningococcus meningitis. The common factors underlying this general increase in the prevalence of respiratory diseases were in large part the result of the impact of war on civilian life. Crowding and the rapid overturn of susceptibles in a population are well recognized as proper fuel for the flames of contagion. This is the inevitable result of mobilization and increased industrial activity. In such wartime conditions much can be learned concerning the dynamics of

spread within the crowd and methods of control among civilians and troops.

Much of the material presented was taken from the records of the Dalhousie Public Health Clinic and the Halifax City Health Department. Considerable basic epidemiologic data had been collected by the late Dr. Allan MacLean, head of the Department of Preventive Medicine at the Dalhousie Medical School in Halifax. Dr. MacLean died in October, 1940, just after the start of the Halifax epidemics. Miss Jean Peabody who had assisted Dr. MacLean in his statistical studies gave invaluable assistance in gathering and analyzing data.

The Harvard group which worked in collaboration with the Halifax public health officials consisted of eleven persons of bacteriological, clinical, and epidemiological interests. It was headed by Professor J. Howard Mueller of Harvard who had visited Halifax early in the epidemic to collect strains of the *gravis* organisms for diphtheria toxin

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\* Read at a Joint Session of the Laboratory and Epidemiology Sections of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 14, 1941.

studies. Plans were laid for the larger expedition from Boston when word was received after Christmas that, not only had diphtheria started again to increase in prevalence after dropping off in mid-December, but that scarlet fever and meningitis had assumed epidemic proportions. It should be emphasized that the Harvard Group were in Halifax for only six weeks and the responsibility and credit for the control of epidemic spread and the reduction of mortality rests with the local and Provincial health officials and practitioners.

Before considering the epidemic diseases separately it will serve to bring them into focus by considering Halifax as a background before and after the onset of war, and the environmental factors present which influenced the spread of respiratory contagion.

The population of Halifax according to the Dominion Census of 1941 was 69,326. Even in normal times it has importance as the largest city and capital of a rather sparsely settled maritime province and as a year round open water harbor where large quantities of goods are shipped to and from European ports.

Medical services and hospital facilities in ordinary times may be regarded as adequate. There is a well organized system of clinics run in conjunction with the Dalhousie Medical School. A 45 bed contagious hospital is larger than necessary for the usual winter cases of diphtheria, scarlet fever, and other contagious diseases. Up to October 1, 1940, there was no full-time health commissioner, and campaigns for immunization against diphtheria and other diseases had not been stressed by public health officials. This was perhaps reflected in the rates for diphtheria in previous years which were higher (some 30 to 80 cases annually) than in communities where a larger percentage of children had received toxoid. Housing was sub-standard in certain sections of

the city, notably along the waterfront. In 1938 some 300 buildings had been condemned as unsatisfactory domiciles but new building projects were not yet under way to replace these tenements. In fact, the housing situation in this city had never fully recovered from the disastrous effects of the explosion of 1917.<sup>1</sup>

As in the last war Halifax became in 1939 an important winter port for shipping war materials and troops. The civilian population increased under these needs and in addition there was a constantly shifting population of the military, naval, and air forces. Merchant sailors manning convoys from all over the world converged here in large numbers. Ample opportunities can be seen in such an environment for the introduction of infection and its rapid exchange.

After the epidemic had started a severe strain was put on local hospital and medical facilities. Two additional hospitals were opened up for the overflow from the contagious hospital and, in spite of its extra beds, at one time in the winter 73 patients were being taken care of in this 45 bed institution. At least one-fourth of the doctors with active practice were in uniform and, for the same reason, public health and bedside nurses were equally scarce. However, the reorganization of the health department with a full-time commissioner took place in time to allow for greater effect from public health activities. This was especially important in the coördination of military and civilian control measures.

In addition to the three epidemic diseases, diphtheria, scarlet fever, and meningitis, there were sharp epidemics of other respiratory diseases, notably influenza and measles, in the late fall and early winter. The influenza was mild and not followed to any extent by post-influenzal pneumonias and deaths. The diphtheria was the most interesting in that it is the first recorded extensive

outbreak due to the *gravis* strains on this side of the Atlantic. Also, diphtheria with its specific treatment, prevention, and gauge of susceptibility is a rich field for epidemiological study and deserves consideration in greater detail.

The incidence among civilians in the 12 months from July, 1940, to July,

decline in rate for diphtheria in the 10-14 year age group is a result of relatively complete immunization among these school children; at any rate a similar decline is not evident for scarlet fever, which is also abnormally predominant in the older ages. More differences in the behavior of meningitis

TABLE 1

*Civilian Population Halifax 1940-1941*  
*Diphtheria, Scarlet Fever, and Meningococcus Meningitis Cases*  
*Attack Rate per 100,000 Population \**

Age Groups	Diphtheria	Scarlet Fever	Meningococcus Meningitis
0-4 years	1,300	1,225	575
5-9	1,833	2,455	144
10-14	1,254	1,702	148
15-19	1,463	1,070	212
20-24	1,490	1,060	215
25-29	963	675	168
30-34	544	451	187
35-39	409	253	156
40-44	281	258	71
45-49	252	27	27
50-54	141	...	71
55-59	168	...	42
60+	138	35	35
Attack Rate at all ages	935	871	164

\* Age specific attack rates based upon age distribution of population at census of 1931 and total population of 69,326 according to the Dominion Census of 1941.

NOTE: The Dominion Census figures are probably incomplete. Sugar ration cards issued place the population at over 100,000, which would give correspondingly lower rates at various ages for the three diseases.

1941, was 649 cases of diphtheria with 24 deaths, 605 cases of scarlet fever with no deaths, and 114 cases of meningococcus meningitis with 16 deaths. Among these meningitis cases were individuals from elsewhere in the province who were hospitalized in Halifax. The peaks of greatest incidence for diphtheria fell in November, and for scarlet fever in March, as is to be expected in these latitudes. Relatively little meningitis appeared until early in December. In contrast to diphtheria and scarlet fever there was very little indication of concentration of meningitis cases in any one area, and only one instance of multiple cases in a family was recorded.

Table 1 gives the three diseases by attack rates at different ages. The high incidence of diphtheria among civilians in older ages will be discussed more fully later. It is suggested that the

as compared with scarlet fever and diphtheria are revealed in this table. The peak of incidence for meningitis is definitely in the preschool children, with a drop in adolescence followed by a rise in the adult years. This might be attributed to greater opportunities for exposure among adult male laborers who constituted the greater number of cases in these age groups. Females were definitely in the majority among adults in the other two diseases.

The scarlet fever was extensive but mild both among civilians and the armed forces. The characteristics of the scarlet fever were so similar to the diphtheria in selection by age, sex, geographical distribution as to suggest that the same factors which helped to spread the diphtheria bacillus were operative on the hemolytic streptococcus. Cases

TABLE 2

*Halifax Diphtheria 1940-1941*  
*Complications and Deaths Compared to Liverpool (Shone, et al., 1939)*

Number of cases	Liverpool			Halifax Gravis
	Mitix 783	Intermedius 571	Gravis 749	
Case Fatality Rate	2.43	10.70	6.58	3.69
% Laryngeal Diphtheria	8.7	0.9	0.9	3.6
% Tracheotomy	5.2	0.5	0.8	0.8
% Paralysis	2.8	15.8	12.3	2.8
% Myocarditis	3.7	14.5	10.9	8.5
% Hemorrhage	0.3	2.1	1.6	....
% Nasal (Severe Epistaxis)	...	...	...	11.0

of scarlet fever and other streptococcus infection combined with diphtheria were noted, but there was no constant association of streptococcus infection with the bull necks and other severe local pharyngeal lesions of diphtheria. Throat cultures on scarlet fever patients and contacts revealed a predominant strain classified as type 19 by the Lancefield precipitin method. This strain was easily recognizable but, because of weak agglutinins, was hard to classify as to serological type in the field by the Griffith method, although independent typings in Ottawa, Boston, and New York suggested that, had agglutinations alone been relied upon, this would have been called a type 17. This is not an indictment of the slide agglutination method of Griffith, but suggests one of those unusual strains with agglutinating and precipitating antigens belonging to different types as have been reported by Lancefield.<sup>2</sup> With a more easily typed epidemic strain and highly type-specific antiserum the method should prove helpful in separating out carriers of epidemic types from those carrying less dangerous Group A strains. This is particularly valuable in army and navy cantonments where one case of scarlet fever may otherwise tie up much of the complement of a ship or barracks.

*Gravis* diphtheria seems to have been an imported infection in Halifax. The first case suspected of being caused by

this strain appeared in September, 1940. The patient was one of the crew of a Norwegian tanker. He was followed by more cases from Norwegian sailors off a whaling ship anchored next to this tanker in the Basin. Some of these men developed symptoms ashore in a Salvation Army Hostel but within 24 hours of leaving their ship. More cases followed rapidly from the waterfront area and it was soon apparent that Halifax was not only dealing with an unusual number of cases but that the clinical severity of these infections was greater than usual. The infecting organism was identified by fermentations and characteristic colony appearance on blood tellurite medium as the *gravis* strain.\* A small outbreak at a summer camp two months before had been identified as caused by the *mitis* variety, which suggests that the later epidemic infection was imported from sources outside of Halifax. The fact that this was exclusively a *gravis* epidemic does not necessarily imply severe infection. Observations vary from the high mortality found in Leeds<sup>4</sup> and by German observers to a position somewhat more virulent than *mitis* and less severe than

\* Mueller<sup>3</sup> has shown that the Halifax *gravis* strains are resistant to the inhibiting effect of small amounts of iron on toxin production. This ability to produce toxin in the presence of iron compounds in a concentration similar to that found in the local tissues of the pharynx may be associated with the rapid spread and relative severity of the diphtheria in Halifax.

diphtheria caused by the *intermediate* strains as revealed by Shone<sup>5</sup> in Liverpool. Table 2 shows a comparison of the Halifax cases with the series reported from Liverpool. The Halifax cases resemble *mitis* infection in the high incidence of laryngeal diphtheria and deaths were certainly fewer here than in most recorded outbreaks of *gravis* diphtheria. However, doctors in Halifax who were familiar with the clinical picture of diphtheria in that locality were in agreement that the disease in the present epidemic showed more extensive membranes and a higher proportion of septic and toxic complications.<sup>6</sup> The low case fatality rate may be explained in part by the abnormal age distribution, with a high percentage of cases in the older age groups. If the Halifax case fatality rates by ages are weighted by a normal percentage age distribution of cases, as for instance Massachusetts cases from 1918 to 1929, the expected deaths are half again as many as were observed. In other words, as the peak of greatest incidence of

cases shifts to older age groups it travels away from the high case fatality rates of infancy and gives an apparent mildness to the disease, as shown by a decrease in the number of deaths.

In the first stages of the epidemic the age distribution was normal. In December there was a decline in cases after the peak of November, followed by a rise in January, when there was a marked shift to the older age groups and the female sex. This dropping off of younger cases coincided with relatively thorough immunization of the school age population. The epidemic was maintained through June, when 50 civilian cases were reported, and the indications are that the epidemic is not yet burned out and that there is still a large reservoir of susceptibles in the unimmunized population.\*

The curve of incidence among the armed forces followed or led the civilians very closely. Study of the records suggests that the epidemic started in the Norwegian merchant marine and quickly spread among the civilians in the waterfront area. Cases in the services appeared first chiefly in the Royal Canadian Navy personnel, whose contacts would be greatest along the waterfront. As with the civilians, there was a decline over the period of the Christmas holidays, followed by an increased incidence in January. Figure 1 shows how the forces climbed steadily in percentage of total cases in the given month, followed by the adult females, whereas the older civilian males and children of both sexes dropped off. Figure 2, cases of diphtheria by age and sex, shows even more markedly the preponderance of female cases between the ages of 15 and 30 years. History of contact with the forces was more than plentiful among diphtheria cases in women between the

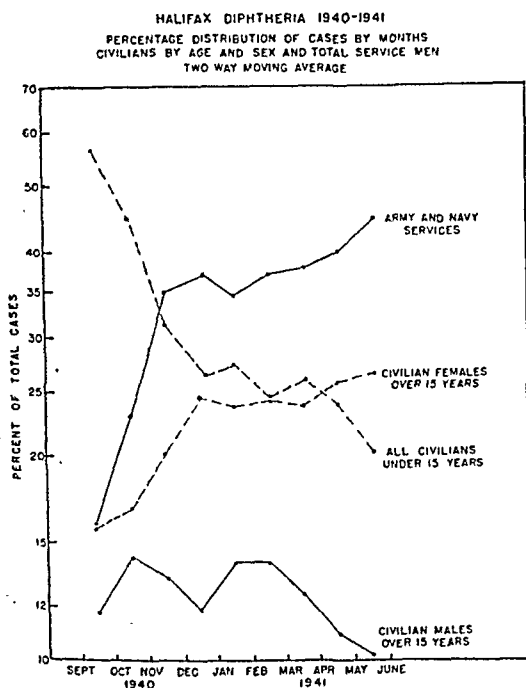


FIGURE 1

\* This is borne out by more recent figures on diphtheria in Halifax. From July 1, 1941, to April 30, 1942, 609 cases of diphtheria have been reported.

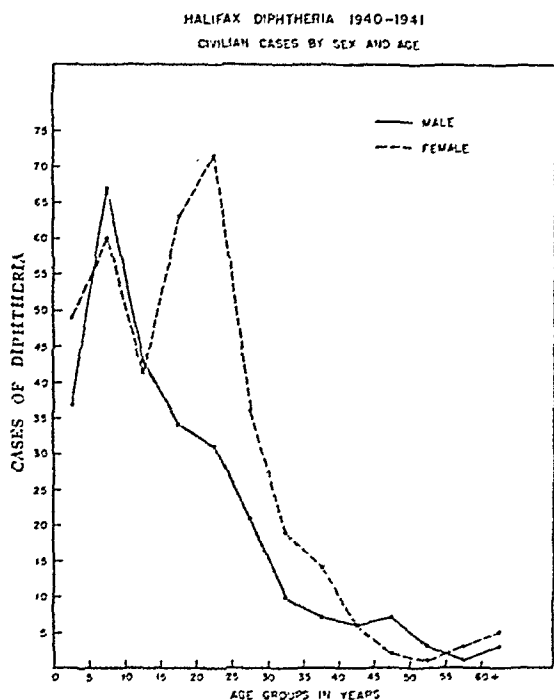


FIGURE 2

ages of 15 and 30. One cannot escape the conclusion from the study of available data that in its later stages this epidemic was maintained by the exchange of infection between the soldiers, sailors, and aviators and their wives or sweethearts in the town of Halifax. This does not preclude the possibility of reservoirs of infection among carriers and missed cases of nasal diphtheria in the preschool age group but, in the opinion of the authors, this was not the principal source of infection in the Halifax epidemic.

As might be expected of any community with areas of overcrowding and poor housing, Halifax had a concentration of cases where housing conditions were at their worst. A map showing the distribution of tuberculosis deaths in Halifax in recent years reveals a concentration of cases in the same areas as the diphtheria spot map. Here one also finds the largest number of multiple cases in houses and families. A carrier survey of over one thousand Halifax school children in February showed rates as high as 30 per cent for carriage

of the diphtheria bacillus in one of the schools of this district, and 20 per cent in another. Not a single carrier of virulent organisms was found in certain of the schools in the better residential district. The average percentage of carriers among school children and clinic populations in the February survey was 11 per cent. In June, 840 school children were cultured and only 2 per cent were found to be carriers. Although there were 50 cases reported in this month, they were chiefly among adults.

Control measures included Schick surveys, isolation of carriers, and the establishment of clinics for active immunization against diphtheria. This was carried out with fluid toxoid, 3 doses at 3 week intervals, followed by a repeat Schick test in 3 months. As the attendance at toxoid clinics grew to hundreds and, for a brief period, even to thousands, practical considerations made it necessary to establish the following routine: All children under 12 years received toxoid at their first visit without regard to primary Schick test or sensitivity test. Older clinic patients received a Schick test in one arm and in the other arm 1/10 ml. of toxoid diluted 1/10 intradermally. This "Moloney Test" of sensitivity to bacterial proteins should be read in 48 hours, but for administrative reasons these patients were instructed to return in 5 days. At that time their Schick tests were read and, if positive, the first dose of toxoid was given. If there was a history of erythema or induration at the site of the Moloney test, toxoid was given in higher dilution and more frequently.

Toxoid reactions occurred only rarely among the older patients but were at times severe, with headache, swelling of the arm, and fever of short duration. Comparative studies on toxoid reactions from materials prepared at the Connaught Laboratories in Toronto and from other sources showed no signifi-

TABLE 3

*Halifax Diphtheria 1940-1941**Estimated Percentage Distribution of Immunes in the Population by Age Groups from Schick Test Surveys and Records of Toxoid Clinics\**

Age Group	(1) % Natural Immunes† by Schick Survey	(2) % Immunized with Toxoid July 1, 1940-May 31, 1941	(1) and (2) Total % of Immunes	(3) % Immunized with Toxoid Before July 1, 1940	(1), (2), and (3) Total % of Immunes
0-4	11	14	25	...	...
5-9	30	26	56	...	...
10-14	45	24	69	...	...
15+	51	1.7	52.7	...	...
All Ages (adjusted)	44.8	7.4	52.2	4.6	58‡

\* The figures are based on 8,783 primary Schick tests and 8,417 completed immunizations.

† The rate of natural immunization during the epidemic is not considered in this table. Evidence from Schick testing at different times between September, 1940, and June, 1941, is not conclusive as to the extent of natural immunization at the subclinical level.

‡ Includes approximately 1.2 per cent of the population who have developed clinical diphtheria within the past 6 years.

cant difference in percentage of reactions. With proper precautions by sensitivity tests it was felt that immunization of older individuals with toxoid was a safe and advantageous method. Credit is due to the efficient follow-up work of the public health

nurses that 92 per cent of the patients immunized completed their full course of 3 doses of fluid toxoid, and 70 per cent of those who started immunization completed their course and returned for a repeat Schick test. Shift to Schick-negativity among those immunized was

TABLE 4

*Halifax Diphtheria 1940-1941**Incidence of Diphtheria in Previously Immunized Population According to the Time Interval Between Immunization and Onset Compared with Incidence in the Estimated Susceptibles of the Total Population*

Interval Between Immunization and Onset	Immunized Population Observed at this Interval	Cases in Immunized Population	Attack Rate per 100,000 Population
0-1 month	5,156*	7	135.7
1-2	5,134	3	58.4
2-3	5,096	3	58.8
3-4	5,018	1	19.9
4-5	4,817	..	....
5-6	4,742	..	....
6-7	4,616	1	23.8
7-8	2,761	..	....
8-9	176	..	....
9-10	131	..	....
10-11	101	..	....
11-12	31	..	....
Total Cases in Immunized Population		15	296.6
	Estimated Susceptible Population†	Cases in Unimmunized Population	Attack Rate per 100,000 Population
	29,117	590	2,027.0

\* Period of observation between July 1, 1940, and June 30, 1941. Eighty-six per cent of the attendance at the toxoid clinics was in the 6 week period between October 20 and December 1, 1940.

† Based on 42 per cent estimated Schick positives in population. See Table 3.



over 95 per cent, according to tests given 3 months after completion of immunization.

An attempt was made to determine the immune status of the community and the results of immunization. It has already been shown that the case incidence among school age children decreased as the epidemic progressed. Table 3 shows the levels of immunity estimated for different age groups in the epidemic year. Note the rise in immunes in the 10-14 year age group. Another method of evaluating the effect of toxoid is to study the diphtheria occurring in immunized children compared with the rates for the estimated unimmunized susceptible population. Table 4 shows a comparison of cases among those receiving 3 doses of toxoid in the epidemic year with those having no history of previous immunization. From this evidence it would seem that the effect of active immunization with fluid toxoid is to protect against diphtheria after a relatively short interval. The transient protection afforded by passive immunization was seen in four contacts who developed diphtheria within a month of receiving 10,000 units of antitoxin prophylactically. A small clinic was established to Schick test, culture, and immunize contacts of cases. Even among the Schick-positive contacts, toxoid was employed in preference to

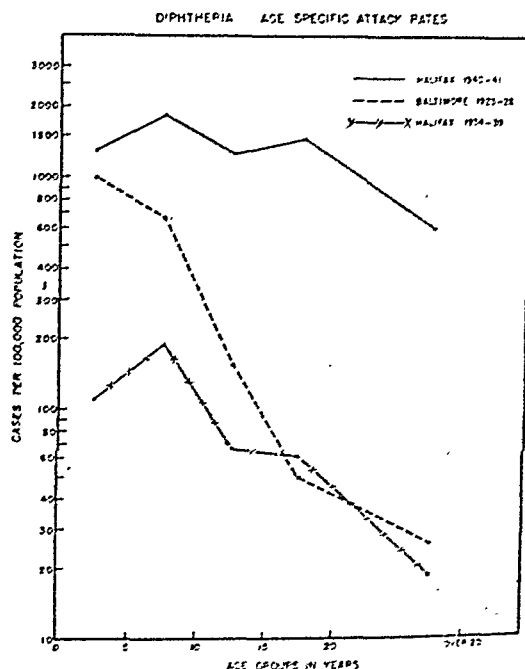


FIGURE 3

prophylactic antitoxin to avoid unnecessary sensitization to horse serum.

The level of natural immunity to diphtheria in the population can be seen in Table 5 of Schick test results in previously unimmunized individuals by age and sex. The relatively higher percentage of negative Schick reactions among males than females at all ages is consistent with findings reported elsewhere as reviewed by Doull.<sup>7</sup> The explanation for this phenomenon is obscure. The generally low level of immunity as indicated by the Schick

TABLE 5

*Results of Schick Testing by Age and Sex on Individuals with No History of Previous Immunization*

*Dalhousie Clinic, Halifax*

Age Group	Number Tested Males	% Negative	Number Tested Females	% Negative	Ratio of % Negative Males to Females
0-4 years	371	12	391	11	1.09
5-9	1,167	35	1,239	25	1.40
10-14	1,645	49	1,672	41	1.19
15-19	407	59	582	43	1.37
20+	167	55	982	52	1.06
Unknown	67	63	93	38	1.66
Total	3,824	43	4,959	37	1.16

TABLE 6

*Halifax Diphtheria 1940-1941*

*Results of Schick Tests in Children, 5 to 14 Years, Compared with Same Age Groups from Other Surveys as to Per Cent Schick-Negative and Recent Prevalence of Diphtheria*

*Includes Only Those with No History of Previous Immunization*

Place of Survey	Rural or Urban	Year	Number Tested	Per cent Negative	Diphtheria, All Ages, Average Rate per 100,000 5 Years Preceding	
					Morbidity	Mortality
Alabama	Rural	1937-38	2,464	89	41.0	4.8
Virginia	Rural & Urban	1937-39	969	60	66.7	5.6
Baltimore, Md.	Urban	1933-34	1,863	51	63.0	3.8
Halifax, N. S.	Urban	1940-41	5,723	38	97.9	6.8
Kingston, N.Y.	Urban	1938	464	33	0.7*	0
Glace Bay, N. S.	Urban	1938	417	22	88.0†	10.3†
Cleveland, Ohio	Urban	1938	960	21	26.9	2.1

\* Only 2 cases of diphtheria and no deaths reported from Kingston in the 6 year period, 1933 through 1938.

† These rates are from reported cases and deaths from diphtheria in Cape Breton County, Nova Scotia, in 1938 and 1939. For Glace Bay the average rates for the 10 year period, 1928 to 1939, are: morbidity, 27.0, and mortality, 5.8. The case fatality rate from these figures is 21 per cent which indicates incompleteness of reporting at that time. The more recent figures from the county in which Glace Bay is situated are considered a better index of the prevalence of diphtheria at the time of the survey.

test survey cannot be attributed in this instance to lack of experience with diphtheria in the past. Table 6 is a comparison of the Schick test levels in previously unimmunized school children in Halifax with surveys on a similar basis from other parts of North America.<sup>8-14</sup> Previous experience of the community with the disease, the attendant carrier rates, and the degree of urbanization are undoubtedly factors in determining the levels of natural immunity, but from the results shown in Table 6 this immunization seems to be more easily accomplished in the south than in northern climates.

The high age distribution of cases is also usually a characteristic of northern diphtheria.<sup>15</sup> In Figure 3 the age specific attack rates of Halifax diphtheria in the present epidemic and for the 5 years, 1934 to 1939, are compared with figures for Baltimore from 1923 to 1928. The two Halifax curves are similar, suggesting a permanent factor influencing the age distribution of cases. However, no such preponderance of adult females was seen in cases before the epidemic and the percentage in older age groups was not so great.

In conclusion, certain implications from this city's experience with epidemic disease should be emphasized in order to avoid, if possible, a similar experience in other communities.

1. The necessity for decent housing in defense areas.

2. To apply to civilian populations and to troops all the effective methods in our knowledge for the specific prevention of disease.

This is especially pertinent with reference to diphtheria. In this disease immunity decreases as one goes north as well as out in the rural areas. Likewise, it becomes less and less of a childhood disease. With this in mind, and particularly with reference to the United States Navy whose contacts are many in the north Atlantic, it is our opinion that every soldier and sailor should be Schick tested, and immunized if found to be susceptible.

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# Need of More Adequate Public Health Programs in the Several States\*

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WITH the clearing of the war situation, the urgent next step of public health administration in the United States is to provide effective local public health service, under governmental auspices, in every community of the nation. This statement is purposely bald, point blank, unadorned, and unqualified. There is deliberately omitted from it any recognition of the difficulties to be encountered, any reference to how the service is to be rendered, and any suggestion as to who shall pay for it. Nor, for the moment, is it desirable to go into details as to the quantity or quality or inclusiveness of service. The essential point to be emphasized is that nearly one-third of the population living in almost one-half of the counties of the United States are without effective tax supported, full-time local health services.

In most human affairs, a historical approach contributes to an appreciation and understanding of a current situation. Generally, too, it provides some insight as to measures to be employed in the future. For these reasons, it seems worth while to view this whole

problem of public health service in the United States in perspective. When this is done there appear to be four fairly well defined periods: First, colonial and through 1868; second, 1869 through 1913; third, 1914 through 1934; and fourth, 1935 to the present. While these periods are not so sharply separated from one another as dividing dates might imply, they are rather definite as to trends. Each has within it certain significant events; each ushered in or brought to a close some concept or tendency or cycle; each offers a background against which the present may be placed.

## FIRST PERIOD, COLONIAL THROUGH 1868

In this period people lived locally, their problems were local, and they acted locally. Unpleasant odors assailed the citizen, local authorities were bombarded with complaints, and, finally, in one community and then in another, laws were enacted or regulations promulgated, prohibiting nuisances and providing for their abatement. Or the factor precipitating action might have been an epidemic. Thus, in Colonial days, when yellow fever or smallpox made its appearance, the Assemblies permitted the various localities to organize boards of health for urgent action. Many such boards of health came into existence, too, because of cholera epidemics which occurred in the United States, beginning

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AUTHOR'S NOTE: As a matter of record it should be noted that Dr. Haven Emerson, though in no way responsible for the opinions expressed in this paper, has for some time been active in emphasizing the urgent necessity of providing adequate health service for every community in the nation.

in 1832 and continuing intermittently for nearly half a century. In the circumstances, it was quite natural that local boards of health were organized long before state boards of health: Petersburg, Va., had a board of health in 1780, but the State of Virginia did not organize its board until 1872. Although the records are not as orderly and complete as one might wish, it would seem that Philadelphia had a board of health in 1793, Pennsylvania in 1885; New York City in 1796, the State in 1880; Baltimore in 1798, or earlier, Maryland in 1874; Boston in 1799, and Massachusetts in 1869.

This observation that local conditions and actions preceded central administration is also to be seen in the development of national health services. It will be remembered that the beginnings of what we now call the United States Public Health Service are to be found in a Congressional Act of 1798, which provided for the furnishing of medical relief to merchant seamen. This Act, however, did not provide for any over-all administration. Instead, each collector of customs appointed a local physician and made such arrangements as were needed for hospital care. To support this medical relief the master of every American ship arriving from a foreign port was required to pay to the collector of customs of the port entered, twenty cents a month for each seaman in his crew. This amount was deducted from the seaman's wages. Under this act of 1798, money collected in one port could not be utilized for medical care of seamen in another port, which again emphasizes that the activity was essentially on a local basis. Then, in 1799, a new act was passed providing that money collected in one port might also be spent for care of disabled seamen in a state adjacent to the one in which it was collected, except in relation to New Hampshire, Massachu-

setts, and Connecticut. After three years, these limitations were removed, and money collected for this purpose went into a general fund, to be used anywhere in the United States for disabled seamen. It was not until 1870, however, that a central administrative agency was provided, and at that time the care of disabled seamen was organized on a national basis. The same transition from local to national status may be observed in the development of maritime quarantine. Although Congress had, as early as 1796, passed laws extending federal aid in the enforcement of local regulations relating to ship quarantine, over three-quarters of a century passed before Congress enacted (1878) a law making this a federal responsibility. Even so, it was not until 1921 that the last local port quarantine station was taken over by the U. S. Public Health Service.

From even so brief a review, it is seen that the essential characteristics of this period were: (1) public health facilities arose only to meet situations where something had to be done, as in epidemics, nuisances, and sick seamen; (2) such measures as were taken were taken by local units of government, or for individual local service. There was no thought of wide-scale planning, over-all administration, or compulsion.

#### SECOND PERIOD, 1869 THROUGH 1913

In 1869, Massachusetts established the first\* state board of health and California organized the second in 1870. By 1913 all states in the Union had similar boards. Quite naturally each board on its formation had to go through a process of adjustment and consolidation before it could hope to function effectively. Most of them did this reasonably satisfactorily and de-

\* This is conventionally accepted, though Kerr and Moll, in *Public Health Bulletin No. 54* (August, 1912), list Louisiana as establishing such a board in 1855.

veloped activities and programs which units smaller than a state could not well undertake. However, while these state boards of health struck a note of new significance in public health administration, they made but little contribution to the development of local health service. It was at first left largely to each unit of government to decide whether or not it would take advantage of legislation which permitted it to provide the community with a board of health and a part-time health officer. Actually, many state boards of health developed the philosophy that from a central office they could render to communities whatever local health service might be necessary. In any event, in the early part of this period local health services remained essentially as they were before the organization of state boards of health: A given jurisdiction might or might not have a local board or part-time health officer. Then in one state and another legislation which had previously left this matter to local option was made mandatory, and by the end of the first decade of this century, units of local government were required in most states to meet these more or less primitive standards.

In the meantime, however, knowledge as to public health matters had increased considerably and the provision of a board of health which met only in emergencies or occasionally, and the services of a part-time health officer whose principal duties were to attend the sick poor and occasionally to engage in vaccination against smallpox, were recognized as being inadequate. With this in mind, thoughtful citizens in many communities organized local effort to meet health needs that were quite obvious but completely neglected by the governmental agencies, and there arose many voluntary health agencies. But the influence of these efforts reached little further than their own borders,

and most state health departments (or boards) remained lackadaisical as to local health work.

Then two new forces entered the field on somewhat of a national scale and exerted definite pressure for governmental provision of local health service. One was the Rockefeller Sanitary Commission, particularly interested in the study and control of hookworm disease, and the other was the U. S. Public Health Service, which in this area of its activities was especially concerned with the problem of typhoid fever. It may be said that as a result of the work of these two agencies there later developed the present concept that the first requisite in public health work is a tax supported local organization competent to render routine direct health service.

Late in this period, too, one of the most significant events in the history of the public health in the United States occurred in the State of Washington. This was in Yakima County, when Lumsden, of the Public Health Service, investigated the typhoid situation, which, in turn, led to the organization of a local governmental health service designed to cope with the problem. Perhaps in the nation there are one or two other counties which have prior claims to what may be called the first full-time county health department, but so far as is known the establishment of health work in Yakima County in 1911 is the first instance where, through coördinated federal, state, and local effort, a new standard of local health service was put into effect.

There is another episode in the development of federal health activities which is significant: the National Board of Health. As has already been said, it was in 1870 that central administration was provided for the Marine Hospital Service, and in 1878 that maritime quarantine was made a federal responsibility. In the meantime

cholera and yellow fever epidemics had so disturbed the nation that there arose a demand for coördinated action. Particularly active in urging this were the leaders of the newly formed American Public Health Association. In response to these demands, Congress, in 1879, created a National Board of Health. But this concept of a national responsibility for health, forecast by providing central administration in medical relief and maritime quarantine, was not sufficiently ingrained to sustain a National Board of Health. That organization was quite active for about four years, remained dormant for another ten, and went out of existence by legislation enacted in 1893. Nevertheless, the mere fact that such a board was created demonstrates what happens when the health problems of a large number of localities are added together.

Viewed in retrospect then, this period from 1869 through 1913 was one where in its earlier years legislation which had previously been permissive as to local boards of health and part-time health officers, became mandatory in many states. It was the period, too, when over-all administration of health matters was introduced in both state and federal governments, and of stabilization and consolidation of state health organizations. Toward the end of the period, there was a promise of interest and aid to state and local health work from the federal government and from a great foundation. Finally, there was another implication: a faint stirring of interest in providing more adequate and effective local health service.

### THIRD PERIOD, 1914 THROUGH 1934

Of particular interest and significance in this period is the fact that, in 1914, the U. S. Public Health Service spent some \$18,000 in field investigations in four counties, and continued this type of work during the next few years; that, in 1917, Congress provided

an item of \$150,000 for "special studies of and demonstration work in rural sanitation." This amount was considered a staggering sum in those days, but what is more interesting is this: The Act stipulated that "no part of this appropriation shall be available for demonstration work in any community unless the state, county, or municipality in which the community is located agrees to pay one-half the expense of such demonstration work." This not only forecast a higher standard of local health work through federal aid, but also required state or local participation, or both, wherever federal funds were used. In a similar manner the Rockefeller Foundation, and later the Commonwealth Fund, and other foundations, made significant and substantial contributions to the extension and improvement of local health service, and constantly observed the principle of requiring local participation in the financing of such work.

The response to this stimulation was encouraging. State health officers responded most gratifyingly. Many of the state legislatures made appropriations specifically for aid in the development of local health services, and in a number of states, where local units of government had no authority to expend funds other than for a part-time health officer, permissive legislation was enacted, making it possible to provide a higher standard of service. As a result of this new interest, and with continuing federal and foundation grants-in-aid, the number of communities with full-time local health service increased fairly steadily for a number of years: From about fourteen in 1915 to nearly five hundred by the end of 1929. However, this increase was not maintained during the next five years, for, whereas on January 1, 1931, there were 557 counties, townships, or districts having full-time health service, the number on December 31, 1934, was 540.

The early part of this period may be called the days of giants in public health administration. It was a time of vision, of action, of great accomplishment. Today's leaders in public health were tried and seasoned, and perhaps somewhat fixed in the mold. In the period as a whole, there was strengthening of state boards and departments of health, there was an expansion in the scope of the public health program, an improvement in the precision of local health administration. It is exceedingly important and significant, too, to note that public health history was tending to repeat itself: in the Colonial period legislation was enacted which permitted local units of government to provide themselves with primitive health organization if they chose to do so. In the next period, though some states took no action, many, through revision of existing laws, made the permissive legislation mandatory, or enacted new legislation to the same end. Now, in this period comes permissive legislation for a higher type of health service. Logically and historically, this new-standard permissive legislation will eventually be followed by laws requiring more modern and adequate health service in all units of local government.

#### FOURTH PERIOD, 1935 TO 1942

The discussion now enters upon the present period, its accomplishments, its trends, its significance, its deficiencies. The event which separates this period from the one preceding is the enactment of social security legislation by the Congress of the United States. This was in 1935. The Act carried two sections of unusual significance. These were Titles V and VI. Through the former, the Children's Bureau received \$6,650,000 to aid in the development of state and local health work in the fields of maternal and child health and care of crippled children. Through Title VI,

the U. S. Public Health Service received some \$8,000,000, for similar aid to state and local governments in the general field of public health. Thus, where previously, federal grants for the country as a whole had been limited to comparatively small sums, the amount available under this new legislation was suddenly raised to millions of dollars. There was a rather rapid increase in the number of local health organizations, an improvement in their quality, an expansion and strengthening of state health departments—perhaps too much of the latter at the expense of the former. Emphasis was given to special problems and programs, and in general public health work in the United States was greatly accelerated. Measuring progress in terms of population provided with full-time local health service, it is found that as of June 30, 1941, approximately 70 per cent of the people of the United States were so reached. Using the county as a unit of local government, the record shows that, as of the above date, in 1,669 counties there was provided full-time official health service. One might say that this is excellent progress, and in many ways it is. But there are nearly 3,100 counties in the United States, and only a little more than half have developed full-time local health service; and there remain some 40,000,000 citizens whose governments have made available to them no better local health service than was possessed by their ancestors. Very few states and no federal health agencies have laid down any forehanded, organized effective plan for remedying this situation quickly and completely.

In the immediately preceding sentence is, perhaps, to be found the greatest barrier to the future of public health development in the United States. The solving of this problem will not be easy, and any plan to provide reasonably adequate public health service to the citizens of every commu-



nity in the country must consider three essential elements: First, it must recognize the difficulties; second, it must provide measures for overcoming them; and third, it must insure for each local jurisdiction or combination of local jurisdictions public health services which will apply to the maximum the present and future public health knowledge.

Of the known deterrents to the providing of effective local health service in all communities in the nation, the following are probably the most important.

1. Failure of most state health officers to be acutely concerned with the large proportion of the population not reached by efficient local health service.

2. Acquiescence, by most state health officers, in the belief that local health service in all jurisdictions in the state can be brought about only gradually and by opportunism and compromise.

3. The fact that in most states the decision to engage upon an efficient health service is a matter of option, to be decided upon by local government.

4. Authority to expend funds for public health purposes is vested in units of local government unsuitable for sound and economical public health education. This is seen more frequently where the township is the unit of local government, but not all counties are satisfactory in this regard.

5. Inadequacy of local financial resources in local units of government.

6. Too small or too scattered population in the local units of government.

7. The inadequacy of state subsidies for aid in providing health service in local units of government.

8. The absence of any clearly-cut formula for effective distribution of state and federal public health funds to local units of government.

9. A tendency of many state health departments to utilize federal grants for building bigger and better central state organizations.

10. The attitude and policies of some voluntary health agencies and physicians, of many part-time health officers, and, occasionally, of strategically placed politicians in the various states and communities.

11. Failure of federal health agencies to make granting of funds contingent upon submission of over-all plan by the state for application of such federal funds in all local juris-

dictions. States receive federal grants on the basis of total population and total needs, but there is no requirement that the benefits of these funds be equally distributed to the total state population.

12. The enticing but treacherous comfort of *laissez faire*.

13. A combination of two or more of the above deterrents.

No sane person would claim that these difficulties are not real or that they may be overcome without effort. On the other hand, only a defeatist would contend that they are insurmountable. It is rather obvious that in spite of the large federal funds made available within recent years, the goal of reasonably adequate health service in all communities is still far from attainment. Further, it must be recognized that those local jurisdictions which now possess such service are generally the ones which occupy favorable economic situations. The units of government to be reached in the future are in the main local jurisdictions which are sparsely settled or very small or very poor or very remotely located, or very smugly stewing in the juice of their own tradition. The old basis of exhortation and salesmanship does not appeal to them. They can be reached only by a new and different approach.

No one may lay down in detail any scheme which would be applicable in all the states, but three necessities stand out clearly if all communities in the nation are to be supplied with local health service. The first is that federal subsidies for health work be granted to a state only if that state submit an over-all plan which will insure effective local health service in each of its local jurisdictions. The second necessity is mandatory state legislation, requiring that every unit of local government participate financially in providing its citizens with an effective local health service. The third necessity is for state legislation which, for purposes of public health administration, provides com-

binations of local units of government so that service may be performed on an economical basis and reasonably completely. As concerns the federal requirement, it would not appear to be either unreasonable or unconstitutional for the federal government to exercise its power to the end that all the citizens in the several states receive the benefits of these federal funds, thus preventing benefits from being distributed in a haphazard or opportunistic manner. Possibly this requirement could be provided by regulations of the Surgeon General and the Chief of the Children's Bureau in relation to the administration of Titles VI and V of the Social Security Act. Certainly it could be effected by amendment to these sections of that Act. If prompt action is to be obtained there must be some time limit for compliance with such a federal requirement. If and when the plan is put into effect, it might be required that a state, to be eligible to receive a grant for improvement of state and local health service must, by previous legislative enactment or by enactment of the next coming legislature, provide the necessary legal instrument for insuring state-wide local health service, and further provide a state appropriation which when added to that state's fair share of federal funds, would be sufficient in amount to provide such effective local health service. Obviously, it would contribute to ease and economy of federal and state administration and would get rid of much confusion and duplication of personnel and effort if, in this process of federal planning, the amazing and distressing separateness of the U. S. Public Health Service and the health activities of the Children's Bureau could be corrected.

In connection with mandatory legislation in states, many will say that the citizens and the assemblies of the states would balk at a law requiring an effec-

tive level of health service in all communities. Probably in some states this would be the case. However, faced with the loss of federal funds unless such funds were used for the benefit of all citizens of the state, probably only a few legislatures would remain adamant, especially as laws requiring a decent local health service would on their merits meet with popular support. And such legislation would be no new thing in state government. Every community is required to have a sheriff or police, courts of law, and a school system, among other things. Also, in the history of the development of public health administration in the United States, as has been recounted, the natural sequence of events has been, first, permissive legislation, the gradual acceptance of this permissive legislation by a number of localities, and then mandatory legislation for all localities. Local government units, thus, at first chose whether or not they would have a part-time health officer and a board of health. Later they were required to have these things. At present local governments choose whether or not they will organize effective local health service. The time has come to follow precedent and make the provision of effective local health service a requirement. The mandatory legislation in question, however, would in some way have to define what constitutes effective local health service, perhaps in terms of per capita expenditure for such services. Also, it would be necessary to provide some formula whereby the amount of funds provided by each local government of a state for local health service would be proportionate to the financial resources of that jurisdiction. Possibly it might be required that each jurisdiction set aside a certain proportion of its tax income. Further, in such legislation it would be necessary to provide that the local unit of government, having made the necessary appropriation, would have

assurance that the state health department, through funds derived from the state legislature and other sources, would be required to subsidize each local budget in sufficient amount to build local health service up to that level previously defined as effective. The exact provisions and requirements in legislation of this sort would naturally vary from state to state, but so long as the legal instrument provided

brought the necessary results, such variations would not be detrimental but rather the contrary.

It is recognized, of course, that the problem of winning the war must take precedence over all other things. On the other hand, it is not too early to give some attention to this matter and to lay careful plans which at some early post-war period may be acted upon swiftly, boldly, and compellingly.

# Wartime Public Health in Alaska\*

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PUBLIC health problems in Alaska, generally speaking, are the same as those throughout the United States, but with many added complications related to the unusual in geography, population distribution, racial composition, weather, transportation, and communication. To these complexities add those of a six year old infant public health organization attempting to establish itself in a Territory which is made up largely of individualists, not too receptive to new ideas regarding public health improvement, and you have a working situation both intriguing and at all times stimulating. When, at last, there appear to be some signs of acceptance of the fundamentals of a public health program, suddenly double the population, add for good measure a war, which is very likely to be fought right at your front door—then you can realize the extent of the task which we face. For one who complains of the monotony of a smooth running health department, a term of service in Alaska in these times would prove at the least diverting.

The Territorial Department of Health furnishes generalized public health services to all people of Alaska, regardless of race. Acceptance of the whole public health program by Alaskans has been slow and, in many cases, reluctant. No city maintains a full-time health de-

partment or health officer. Public health laws are loosely drawn and in many instances sadly outmoded and obsolete but, in spite of this, the public health nursing programs in the various towns are well supported. Another indication of the interest of Alaskans, when sold on a proposition, is evidenced in their support of the tuberculosis control program. Their contribution to the voluntary Alaska Tuberculosis Association for the past three years has been 10 cents per capita, one of the most generous of any people under the American flag. In fact, this is the highest of any state, with the exception of Delaware.

I believe that Americans generally, and particularly those on the Pacific Coast, have a good mental picture of the geography and population make-up of Alaska, but there are some features, particularly as they relate to the war effort and bear on public health problems, which deserve a few brief comments.

The first of these is the immensity of the Territory. With its almost 600,000 square miles of land area, it is one-fifth the size of the whole United States. Spread these miles over with generous portions of high mountains, huge ice fields, thousands of lakes and great rivers, and then drench certain of these areas with as much as twenty feet of precipitation in a year, and you find conditions peculiar to Alaska alone.

The population of Alaska, according to the 1940 census, included some

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72,524 people, 39,000 of whom are white, 32,500 Eskimos, Indians, and Aleuts, and the balance made up of Filipinos, Japanese, and others totaling 900. This census, which was begun in October, 1939, was undoubtedly quite accurate at the time it was completed, but since then conservative estimates indicate an increase of at least 75 per cent in Alaska's total population.

In the best of times, as, for instance, before the war boom, transportation in Alaska was difficult, uncertain, and expensive. The total travel budget for our field personnel of seven persons in the 1942 fiscal year amounted to \$13,300. All methods of travel available are utilized—airplanes, boats, trains, automobiles, but seldom if ever are dog teams used. The airplane has proved a real boon to Alaskans. One can get a plane almost any time to go anywhere, with the conditional "WP"—"PW," which means "Weather Permitting" and "Pilot Willing." I always start a field trip with a great deal of misgiving, as invariably when I am away from Juneau I will spend as much time waiting for boats or for favorable flying weather as I will in actually doing my field work. To pay a winter visit to our nursing service in Nome, some 1,500 miles from Juneau, means an outlay of travel funds alone of \$300, and it may take from 5 days to 4 or 5 weeks to complete the circuit.

Communication is likewise difficult. Letters from some of the reporting villages may take as long as six months to reach the Juneau Office. Radio service is found to be most satisfactory but, even at the half rates available to Territorial agencies, it is extremely costly. Then, too, because messages go not by wire but by radio, they are subject to the strictest military censorship, and often we cannot actually say what we want to say for fear of giving valuable information to the enemy.

The influx of the advance army of

civilian workers on defense projects began in earnest in the fall of 1940 and has continued undiminished up to the present. Exact knowledge on the increase in the population of Alaska is not available, but what we do know is that the continued inflow has made it impossible to plan even from month to month on the needs of established communities, as all plans of Alaskan strategy are military secrets.

One night the people of a community go to bed to wake up in the morning with a transport or two tied up at the docks or anchored in the previously quiet harbor, and the streets and surrounding roads teeming with men of the armed services. Over night a quiet and self-contained little Alaskan town has been transformed into a city—in most instances a rather "rowdy" boom-time city.

All this is happening in many communities, and the townspeople are simply overwhelmed in attempting to supply the diverse needs of these many boys and young men. These towns, all deficient in the ordinary facilities necessary for healthy recreation and entertainment, are unable to provide them. Some progress along these lines is being made, but in practically all cases the descent by these armies of civilians and the military has come so suddenly and unexpectedly that there has been no opportunity for communities to foresee their needs and prepare for their coming.

As long ago as July, 1941, together with officers of the Public Health Service, I made a personal survey of all Navy and Army bases under construction, with a view to obtaining funds under the Community Facilities Bill to provide the necessary sanitary and recreational needs for the adjacent communities. The requirements were almost too numerous to list, but recommendations were submitted immediately to Washington for health centers, hos-

pitals, water supplies, and sewerage systems. This program, however, has been painfully slow in getting under way. Nine months have passed since the survey was made and the first recommendations went in, and we are still waiting for many needed facilities. The fault does not lie wholly with red tape, but is due in part to the reluctance of local communities to accept their share of the responsibility, and to their suspicion of being given so much for so little.

In a few instances, the contractors importing civilian workers to the various defense projects have built their own towns completely. They have erected hospitals, clinics, barracks, mess halls, bath houses, laundries, and have provided some recreation facilities. Some have built temporary small family units for those workers who have brought their wives and children. In a few cases they have built temporary school buildings for these workers' children and for children of the families of the Army and Navy personnel. In these areas no serious public health emergencies have developed, but this type of development has been much too rare.

In the majority of cases the workers and their families have arrived in these small frontier towns and have been forced to shift for themselves in all respects. Shanty towns have grown up on the tundra surrounding the defense projects and nearby towns with all the concomitant health and sanitary problems imaginable. Schools have been overcrowded to such an extent that they have been forced to hold classes in shifts. People have been forced to sleep wherever they could find shelter and to eat in restaurants so overcrowded, and served by people so overworked that they would at times just "close shop" to get some much needed rest.

One experience I had which was not

too uncommon in many other boom towns in Alaska, occurred when forced down in a snowstorm in the interior on a flight from Nome to Anchorage. We landed at dusk on a newly improved field, under construction by the Civil Aeronautics Administration, ours the last of fourteen planes to get in. On inquiry at the better of the two roadhouses, I found that my only chance for a bed was to wait until the 1:00 A.M. shift went to work and then to crawl into the warm bed of some night-shift worker, for a few short hours. They were working on that field in the month of November, three shifts in each 24 hours, and were sleeping three shifts in every cot and bed. At the same roadhouse, incidentally, meals were \$1.50 each—breakfast, dinner, or supper, regardless of taste or appetite.

Immediately following the declaration of a state of unlimited emergency by the President on May 27, 1941, a series of meetings of the Divisional Directors of the Health Department were devoted to planning for probable needs in carrying on the regular program of the department as well as preparing for other exigencies.

Conditions in Alaska being unlike those in any of the States, each town or village is isolated from the others. If the war actually comes to Alaska, many of these towns will be completely isolated as regards outside help, so that plans for civilian defense and emergency services and supplies are based on the precept of self-sufficiency.

Among the subjects considered were those related to obtaining and maintaining large supplies of biologicals and their distribution to various strategically located towns throughout Alaska, plus the institution of a territorial-wide immunization campaign.

Through the Division of Communicable Disease Control adequate supplies of biologicals, including immunization stocks of typhoid fever, smallpox, diph-

theria, and whooping cough vaccines, tetanus and gas gangrene antitoxins, anti-meningococci sera, and drugs for the treatment of syphilis and gonorrhea, were obtained. Emergency depots for the more important of the above materials were established in each town where a Territorial public health nurse was located, so that there was a wide distribution of these materials throughout the whole territory. These stocks have been utilized freely by the civilian physicians as well as by the medical officers in the armed forces. These supplies are being drawn upon constantly and are being constantly replenished.

In February the program for the immunization of all children and adults against certain diseases was intensified. The diseases against which this program was especially directed were typhoid fever, smallpox, diphtheria, and whooping cough. Large stocks of biologicals were placed at the disposal of the private physicians through the public health nurses. The results have been most satisfactory in the protection of an increasing majority of the population. It was necessary to establish a rather liberal fee system for clinics and this has proved, by all ordinary standards, unusually expensive, but nevertheless very worth while.

Ninety per cent of our food must be transported by water from Seattle, as must most of the other necessities of life. With this in mind a food survey was made in December in all the principal towns of Alaska by the National Resources Planning Board in coöperation with the Territorial Department of Health. This was accompanied by an inquiry regarding stocks of drugs, bandages, surgical equipment, and other medical supplies. Response to this survey was slow because of disrupted communication facilities, and it was not until considerably later that an analysis of these stocks and probable future re-

quirements was possible. On the basis of this information, however, requirements in the way of first aid and emergency medical and surgical supplies were estimated. An estimate of the cost of these supplies delivered in Juneau for distribution throughout the Territory was made and the American Red Cross was queried as to its ability to furnish these needs immediately. Promises for furnishing these supplies were forthcoming and some of the materials soon began to arrive. However, as the equipment and supplies provided were neither adequate nor contained the items specifically needed, communities have been forced to improvise. Shortages are still evident in most towns but it is hoped these will be corrected in the near future.

Through the Division of Maternal and Child Health, a pamphlet, "Food Facts," describing ordinary nutritional requirements, was prepared and has been widely distributed. In this pamphlet are listed substitute diets which will provide the elements of good nutrition under emergency conditions. By proclamation from the Office of the Governor of Alaska, residents have been advised to store all food supplies possible, for emergency needs. This is in direct contrast to the policy in the United States proper relative to food hoarding, but as Alaska is so unusually situated it is felt advisable for families to lay in as much food as they can safely store. The department has co-operated with the University of Alaska Extension Service in stimulating Alaskans to plant gardens, and a considerable amount of literature has been distributed by health agencies to future gardeners for this purpose.

Anticipating the many threats to the ordinary routine of a public health department, the policy has been to anticipate probable emergencies in the towns of Alaska which might be caused by enemy action. Sanitary require-

ments in the various areas were analyzed and necessary advisory literature was prepared and distributed to the many exposed communities relative to improvement and safeguarding of water supplies and sewage disposal systems. Other literature was distributed, treating with housing and food and milk sanitation.

The destruction of water supplies is one of the greatest threats, not because of a lack of available water, but because of the possible use of contaminated water. Plans for the patrol and the protection of water systems have been issued to the utility boards of the various cities, and the methods by which units may be supplemented or replaced. Also, detailed instructions have gone out for the proper sterilization of water in case it becomes necessary to use water from a questionable source. Plans for the substituting of pit privies and the maintenance of such have been completed and town officials have been informed of the methods and requirements for this type of public need. Plans have also been completed for emergency housing, not only of the casualties and hospital cases but also of the general civilian population in all the larger towns. Consideration has been given to the public health supervision of the many bomb shelters which are to be used in emergencies, as well as to the community kitchens for feeding large numbers of persons on an emergency basis, and organization for their supervision is being completed.

Early in the fall of 1941 plans for civilian defense organization were instituted. All our public health nurses had complete courses in Red Cross First Aid and many were qualified instructors, as were most of our other professional and technical personnel. All members of the Territorial Department of Health, including the clerical and stenographic staff, volunteered for active participation in defense and emergency medical

organization, and in many instances were the leaders in medical and first aid preparation. Thus, by the end of November, all preliminary preparations were completed in most of the Alaskan communities to respond to almost any emergency.

Each town, at the instigation of the local Red Cross Chapter, organized women's corps of Red Cross workers to be trained in first aid and volunteer nursing services. Groups were organized to prepare first aid equipment, and many of the local schools, through their manual training instructors, and with the assistance of various service organizations, prepared portable first aid kits, stretchers, first aid station signs, air raid shelter signs, etc. Local physicians volunteered their services in manning casualty stations and emergency hospitals and assisted generously in planning the organization of the First Aid and Emergency Medical Service. In each town one physician was appointed as the emergency medical director and was made a member of the committee on civilian defense, thus integrating the first aid and medical work with that of general civilian defense.

From the very first, public health laboratory services have been made available to all the armed forces in Alaska and have been continued, even after the establishment of a large military laboratory. A program was worked out through our laboratories for blood typing all civilians in Alaska. A printed certificate for each individual typed was then issued, indicating that the person was negative to syphilis on that date, and was of a specified blood type. This plan was developed because of the impossibility of establishing adequate blood serum or plasma banks in Alaska, and because of the apparent impossibility of obtaining adequate plasma from the "outside." The typing of civilians eliminates one step



in the procedure of transfusion, if it becomes necessary, in the case of either donor or recipient. The inadvisability of attempting to prepare serum or plasma in Alaska again relates to the expense of the equipment, the small isolated towns and the still smaller hospitals. The largest civilian hospitals in Alaska do not exceed a total bed capacity of 65, and most of them are much smaller. Releases of the Office of Civilian Defense state that it is not feasible to organize the formation of plasma bank centers in hospitals of less than 200 beds.

The blood typing service has also been used on occasion by the Army, Navy and Coast Guard, particularly in Juneau, and at this writing more than 1,000 persons have been typed and serologically tested. As worked out in Alaska, the individual does not necessarily have to present himself to the laboratory to provide the specimen, but may have his blood drawn by a physician anywhere in Alaska, and the specimen is then mailed by the speediest method of transportation to either the Juneau or Anchorage laboratory, where the typing and serology are done. Reports are provided to both the patient and the physician submitting the specimen.

Arrangements have been completed with the Office of Civilian Defense and the American Red Cross, whereby the Department of Health will be responsible for the storage and distribution of blood plasma when and if it becomes available to the Territory. This plasma, of course, will be used only for unusual emergency needs and will be stored at strategic areas throughout the Territory.

Consultative service to the armed forces is available from the Divisions of Communicable Disease Control, Sanitation, and Laboratories. The Division of Public Health Nursing, through its various nurses in the many

communities, has been able to provide ordinary public health nursing services to the families of civilian workers and the armed forces, as well as to carry on all the many special activities which have arisen in the public health nursing field.

Public health educational material in the form of news releases, pamphlets, motion pictures, and radio talks, have been used with the hope of improving public health in general, and have covered all the diversified phases of sanitation, nutrition, home nursing, and emergency services.

One of the most serious problems in Alaska at present is related to three preventable diseases. These are tuberculosis, gonorrhea, and syphilis—of importance in the order named. Tuberculosis, of course, is a problem involving the civilian population largely, while the latter two, which under pre-war circumstances were of comparatively minor significance in Alaska, are, under present conditions, becoming of increasing importance.

The tuberculosis problem in Alaska is as old as the coming of the white man. According to all available statistics, the incidence of tuberculosis in the Territory is greater than in any state or other territory of the United States. The rate of infection is extremely high and the death rate a close companion. It is true that tuberculosis is much more prevalent among the natives than the whites, but accumulating statistics indicate that it is increasing among the white population year by year. A trite but true proverb in Alaska is that the white man first gave tuberculosis to the native and now the reverse process is true. The general death rate from tuberculosis for the year 1941 was 356.0. The death rate among natives for the same year was 701.6, and for the white population 63.9. The likelihood of the spread of tuberculosis to civilian defense workers and the armed

forces by infected residents does not seem too remote, and will certainly occur where intermingling of the enlisted personnel and civilian defense workers with the natives continues as is now the common practice.

One extremely serious and important public health problem which has not been adequately controlled is the increasing incidence of venereal diseases. The companion plague, prostitution, flourishes even more freely under present conditions. This is no new problem in Alaska and, although always of serious consequence, has in the present situation taken on new and dire significance. Alaska has been known as America's "last frontier" and as such has condoned conditions, in many instances quite openly, which would hardly be tolerated in the States. With the coming of this army of workers and fighters to the Territory and with few of the common recreational facilities available, professional prostitution has become a real threat to an all-out war effort.

Control measures consist, in the best regulated areas, only in the registration of the professional prostitutes, and weekly examinations by part-time health officers. They are finger-printed and photographed and if found free of infection are permitted to practise their profession unmolested, except for the weekly check-up. They are permitted to go and come as they choose and, even if found infected, are then only ordered to move out of town without any regular notice or warning to the police or health officials in the next town where they will take up their residence.

The Territorial Department of Health has established detailed plans and procedures by which venereal diseases and professional prostitutes might be more adequately controlled. Reporting of venereal disease cases has been simplified; free laboratory services have been

made readily available; a wide variety of anti-syphilitic drugs are furnished free to physicians for the treatment of any case of syphilis, new or old, indigent or able to pay; and, finally, a fee system has been set up to reimburse physicians for the treatment of medically indigent patients. Drugs for the treatment of gonorrhea are available to physicians on the same basis as for syphilis, and laboratory diagnosis by smear and culture are available to those communities which are readily accessible by plane.

These procedures have not proved adequate for effective control. Much of the fault for the existence of professional prostitution lies in the local communities' *laissez-faire* attitude, but all the blame cannot be credited to the townspeople and officials, for it can be said, with reservations in only one or two instances, that the officers of the armed forces have not viewed with favor a program of repression of prostitution.

With this attitude prevalent, the institution of an organized program for the repression of prostitution has proved not only difficult but, to date, almost out of the question. The small and isolated towns, deficient in ordinary healthful recreational facilities and served by overworked part-time health officers, complacent city officials, and an indifferent public opinion, provide a set of barriers which we have found impossible to surmount. The answer to this problem might be found in a stronger program carried on by personnel from the Territorial Department of Health. This has proved to be not only impracticable but impossible, as the communities are too widely scattered and the central staff too small.

Assistance has been promised by the Public Health Service in the form of trained public health physicians to be assigned to the department to establish and to carry out the necessary measures. The coming year will show some

changes, for venereal diseases are increasing among the civil and military population, and the institution of adequate control measures becomes imperative. When Alaska continues to maintain second place in the gonorrhea rate of all states and territories, as it has for the past year, forceful measures are indicated.

The threat of war to Alaska has seemed very close in the past five months and seems closer with each passing day. We in Alaska feel that eventually we will have to play a more im-

portant part in this war and that it will certainly reach us eventually in the somewhat doubtful future—at any rate that is the basis on which we are making our preparations. It has brought to light many new and unsolved problems. We in the Territorial Department of Health have attempted to foresee the emergencies which will arise when the bombs actually begin to fall. We have planned as carefully as possible for these emergencies and for the most part feel that we are ready to meet them.

# The Modern Public Opinion Poll\*

## A Means of Defining and Appraising Community Health Education Problems

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A BUSINESS man steps out on the street from the entrance of his Park Avenue apartment in New York City. A young man carrying a sheaf of ballots approaches him, saying: "I would like to get your opinions on some public health problems. The Health Department is trying to find out what the public believes about tuberculosis."

"Well—fire away as I walk along. But I'm afraid I don't know much about it."

"What do you think is the cause of tuberculosis?" asks the young man.

A moment's reflection, and then, "Most persons that get tuberculosis have brought it on by not taking care of themselves. They dissipate too much—too much smoking, drinking, and night life—and it just catches up with them."

The young man, jotting down notes on the ballot as he walks along, gives no hint of his own feelings on the validity of this assertion. His task is to get answers, not supply them. He next inquires, "Do you think tuberculosis is contagious?"

"I understand that it is, but I believe it is brought about more by the way an individual lives than anything else."

In the next few minutes the young man has noted the business man's viewpoints on how he believes tuberculosis is spread, the possibilities of curing it, the methods for treatment and diagnosis, and whether he believes it can be inherited. Cordially thanking him for giving his opinions, the young man says goodbye. He stops around the corner, however, to complete the information on the ballot which will properly classify the business man in the cross-section of the public that is being interviewed. Age, sex, economic status, nationality, and location of residence must be noted before the ballot is completed, and to make such classifications the interviewer has had to ask some other questions. These questions were prefaced by the statements, "To be sure that my interviews cover all types of persons living in the city, I would like to get just a little information about you—but I *don't* want your name." Questions would then be asked such as, "Would you mind telling me the general nature of your occupation?" "Were your parents born in this country?" or "Do you live in this neighborhood?"

Visualize hundreds of such interviews being made by capable interviewers, concerning health problems and services, and among all types and classes of persons living in the community. That is the way the public opinion poll technic was used by the District Health Educa-

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tion Demonstration of the Department of Health in New York City to study some of the educational needs of the 200,000 persons living in the Kips Bay-Yorkville Health District of Manhattan. Also, when Dr. Wilson G. Smillie, professor of Preventive Medicine and Public Health at Cornell University was making a survey of the facilities for the care of the sick in Rochester, N. Y.,<sup>1</sup> he considered it valuable to ascertain the feelings and opinions of the consumers as to the adequacy of their services by means of a poll.

Most large business corporations wishing to influence the public to use their products make a systematic and continuous study of those persons who constitute their market. They find it a sound investment to study the buying habits, living habits, opinions, types of advertisement read, radio programs listened to, and many other matters in the daily lives of all of us. From such an analysis, planning begins as to the best procedure for merchandising and advertising their wares.

The various national, state, and local health organizations have made little effort to adopt such research procedures to study *their* market. Vital statistics, incomplete morbidity statistics, sociological surveys, etc., have been the bases for planning. Valuable as these are, it must be recognized that the effectiveness of any community's preventive or curative health services is, in the last analysis, determined by the personal reactions of its residents toward those services. Therefore, efforts toward adult health education not based upon some accurate knowledge of the thoughts, feelings, and present level of understanding which characterize the cross-section of human beings comprising a community, can be neither completely realistic nor efficient.

Knowledge of the opinions of the man or woman on the street, the clerk in the store, the waitress, the truck

driver, the housewife, the big and little business man, and all the others who make up the typical cross-section of the American community can be very valuable to public administrators and educators. For instance, after carefully interviewing such a cross-section, the New York City Demonstration found that some types of education were ineffective and others of less importance than previously believed.

In certain instances polls reveal substantial reasons for the public's not acting according to the knowledge it may possess. In such circumstances the educator might go on indefinitely trying to achieve a result unattainable by education alone. Illustrative of this point are the results of one of the polls in New York City. The Maternal Hygiene Committee of the Kips Bay-Yorkville Health Center decided to conduct an educational campaign to secure earlier registration for prenatal care. Such a campaign was felt necessary because available records indicated that in this district 50 per cent of the expectant mothers did not register with a clinic or physician until after the 6th month of pregnancy.

When a representative cross-section of the more than 200,000 persons residing in the district was asked about this matter, it was disclosed that over 90 per cent believed that a prenatal examination by a physician was essential, and over 70 per cent believed that prenatal care should be started between the 1st and 3rd month of pregnancy. Obviously, there was little need for the majority of the persons to be convinced that early prenatal care was considered of value. Why, then, the discrepancy between what the people believed and their actions?

For one thing, the poll revealed a distaste for having such prenatal examinations done in hospitals. Since many of the persons in this district, for economic reasons, have to attend hos-

pital clinics rather than consult private physicians, this was a point to be further studied. Why, if they could not afford a private physician, and if they believed that prenatal care was of value, did they not use the clinical facilities in hospitals which were well equipped for giving such care? The answers ran in this vein: "Too many men doctors around." "It is a strain on your nerves and your body to go to a clinic." "Don't like strange doctors pawing me." "You don't get any individual attention—treated like guinea pigs." Other comments showed that hospital administrative procedures, as well as factors in the training of certain private physicians, tended to discourage early registration. In brief, certain aspects of this poll did indicate a need for specific kinds of public education, but the whole problem of securing early pregnancy registration was revealed to have far more implications than could be solved by education.

This situation will serve to illustrate some generalizations which must be taken into account when evaluating the results of a poll.

In an interview a strong negative reaction concerning a situation may or may not indicate wherein the fault may be, since the opinion may be founded upon hearsay or unrealistic expectations as to what a service can or should be. It must be noted, however, that the variety of justifications in the way of comments which people give for their opinions frequently arise from the individual's own experience. These comments are sometimes tinged with emotion, false propaganda, loose reasoning, self interest, or even bitterness but, taken as a whole, they tell a dynamic story. In that story is reflected a stern caution to the educator to remember that personal experience remains the most decisive and permanent form of learning; an object lesson which both administrators and educators, in evolv-

ing their elaborate programs, sometimes forget.

The public opinion poll might be considered the modern counterpart of the "town meeting" because it affords a unique opportunity for democratic expression of opinion in a complex urban community. At the same time, the modern poll, properly conducted, represents an honest search for facts. The results sometimes give little comfort to those unaccustomed or unwilling to face realities.

#### POLL RESULTS

The following summaries indicate the nature of the material gathered in New York City and Rochester. Interpretation of these results in terms of applying the information to constructive planning cannot be attempted here. In most instances, however, the implications will be obvious.

##### *New York City—*

In one poll, while 68 per cent of those interviewed knew the Health Department operated district health centers, almost 80 per cent had no idea what services they furnished. Only a questionable 16 per cent knew the exact location of the health center in their district, since there was reason to believe it was confused with a hospital half a block away.

Eighty per cent believed that our modern way of living had not made it more difficult (physiologically) for women to have children. (The majority think better medical care makes up for any other deficiency.) Eighty-seven per cent thought children should be born in a hospital rather than at home. Of the seven tests or measurements made by a physician in the examination of an expectant mother, 48 per cent of the persons knew two or more.

More than half of those interviewed on one poll did not know that more persons in New York City during 1938

had been killed by falls in their homes than by automobile accidents. A number of persons stated that they had read or heard that more people were killed by falls, but—*they still didn't believe it!* There is a challenge to the ingenuity of the educator!

When asked who they believed was usually at fault in traffic accidents, 37 per cent said pedestrians, 34 per cent said car drivers, and 28 per cent said it depended on the situation. Over half (58 per cent) of those who felt the pedestrians at fault were car drivers, while of those who felt the drivers were at fault, 65 per cent were persons who do not drive cars, *i.e.*, pedestrians.

Only 22 per cent of the persons interviewed said that tuberculosis was caused by a germ, but 68 per cent believed it to be contagious. That climate is the most important treatment for tuberculosis is still believed by 45 per cent. Opinion was almost equally divided as to its being inherited. The contradictions in these figures on the tuberculosis poll (which also occurred in the national poll) are an extremely good indication of the confused thinking of the general public about this disease, in spite of all the education presumably undertaken.

#### Rochester—

Dr. Smillie in the section of his report on conclusions and recommendations regarding the Rochester, N. Y., study makes the following statement:

The popular opinion study is particularly interesting in that it indicates just how the people themselves feel about the plan for care of the sick that has been developed by the leaders of the community. The people speak in no uncertain terms concerning existing inadequacies, and emphasize what they would like to have done in order to bring about an improvement in the existing situation.

The ballot used in Rochester contained some fifty items dealing with various aspects of care for the sick. The following items are mentioned from

the poll for their general interest value:

One of a series of questions about physicians asked: "How did you pick your doctor?" The replies ranged over a considerable expanse of reasons for selections, but only 5 per cent indicated that their choice of a physician was based on preliminary investigation of his training, hospital staff connections, or such other criteria as are usually recommended. In another question, approximately 5 per cent indicated they seek aid from osteopaths, chiropractors, or Christian Science practitioners.

Rochester pioneered in developing hospital insurance and had under consideration a plan for medical care insurance at the time this poll was undertaken. The public response to questions regarding these insurance plans was therefore quite important.

The first question asked: "Do you believe the average family should have hospital insurance?" Ninety-two per cent said *yes*. The next question was: "Do you believe the average family with children can afford to pay \$1.30 a month for hospital insurance?" Eighty per cent said *yes*. Then they were asked: "Would you like to have a similar insurance plan (to hospital insurance) to aid in paying for medical and surgical care?" On this 72 per cent said *yes*. The probable cost was included in the next question: "Do you think the average family with children would be willing to pay \$3.00 a month, in addition to what they pay for hospital insurance, to cover medical and surgical care?" To this only 22 per cent unqualifiedly said *yes*. Obviously, when the results and comments on these questions on insurance were carefully broken down and analyzed, plans for further promotion could proceed on a vastly more realistic basis.

Partly as a result of the Rochester poll the visiting nurses changed their organization name from Public Health Nursing Association to Visiting Nurse

Association. Only 8 per cent of those interviewed could give the name when asked, "Do you know of any agency in Rochester which furnishes trained nurses at small fees for each visit?" Of those who had used this service, however, the result was 100 per cent enthusiasm. It is to be doubted after this poll that a service so highly regarded by its users will continue much longer to be unknown to the majority of the city's residents.

One question asked: "Is there any medical care which you feel you need but do not have taken care of because of the cost?" Only 15 per cent said yes. The comments for this group indicated that almost half referred to surgical attention believed necessary, and a third referred to needed dental care. Practically all the conditions mentioned were chronic disorders which presumably caused some annoyance or discomfort—hence the desire for medical care. Obviously the broader concepts of preventive medicine are apparently remote to the layman. It should be added, for the record, that men and women were represented in equal numbers among those saying yes on this item.

Dissatisfaction expressed in certain quarters with the plan used in Rochester to supply medical care for the sick poor was explained in part by the poll. It revealed that over a third of the poor and very poor did not understand clearly the procedure for obtaining a doctor, without cost, for an illness at home.

#### THE TECHNIC

Simply defined, a public opinion poll is a method of determining public reaction by interviewing a scientifically selected cross-section of the population. It should not be confused with "straw votes" taken of such population groups as telephone subscribers or automobile owners, in which the emphasis is on amassing a large number of returns. "Straw votes," regardless of the quan-

tity, are not representative of all the heterogeneous opinion groups (e.g., young people vs. older people, wealthy vs. poor, etc.) in the total population.

In the public opinion poll, the number of persons interviewed is not nearly so important as is the accuracy and representativeness of the cross-section of the population which is to be interviewed. Once the cross-section of any unit of the population (e.g., a city, county, or state) has been accurately determined, a relatively small number of interviews, if they adhere strictly to that cross-section, will produce a fairly true picture of how the population is thinking about any given problem *at that time*. The classifications or controls which are used in determining a cross-section of the population will vary according to the purpose of the sampling procedure and the nature of the population to be considered. The main point is that interviews should be obtained from each of the opinion groups which make up the total population of a community and *in exact proportion to the size of that group in terms of the total population*.

In the polls conducted in New York City and Rochester, N. Y., the cross-section to be sampled contained five statistical controls: age, sex, nationality, economic status, and geographic distribution of the population. Each one hundred interviews tabulated had to be apportioned perfectly to these five controls. A spot map made of each hundred interviews showed geographical distribution in conformity with population densities, as well as a general spread. In each hundred there had to be the correct percentage of persons of above average, average, and below average income; of persons between 18 and 44 years of age and over 45; of men and women; and of foreign white and native white stock.

In conclusion it is pointed out that the modern public opinion poll, properly

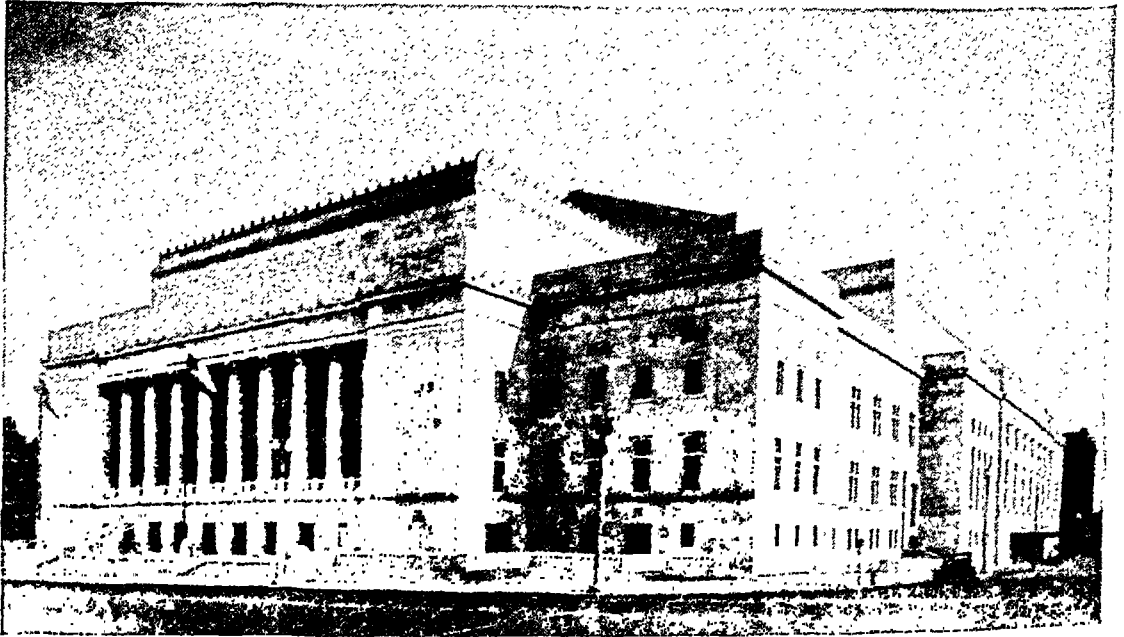


conducted, is a scientific statistical procedure. To be of value it must be done carefully, by a person well trained in the technic, and conducted as an honest search for facts. With a staff member of a health organization properly trained in this procedure the cost of conducting opinion polls is not prohibitive, and may well be considered a sound invest-

ment in providing materials for efficient, intelligent planning of future work, not only in education but in public health administration.

#### REFERENCE

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# Effect of Hibernation on Content of Coliform Bacteria in Oysters

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DURING the autumn and winter of 1940 and 1941, the Department of Pensions and National Health and the Fisheries Research Board of Canada undertook an investigation of the effects of hibernation on the coliform bacterial content of oysters at Buctouche, N. B. It was thought possible that the contamination of oysters grown in some areas too polluted to permit direct marketing at other seasons might be sufficiently reduced during the winter hibernation period to make them safe food products. If hibernation was found to be a factor of safety, closure of such polluted areas and a consequent serious economic hardship to fishermen might be avoided.

It has long been known that feeding activity ceases in our Atlantic oysters (*Ostrea virginica*) at a temperature of about 5° C., apparently because the coördination of ciliary activity breaks down (Galtsoff, 1928). At temperatures close to 0° C. oysters remain closed almost continuously and are so inactive that, although they do not feed at all for long periods, the glycogen content is not appreciably reduced. It has also been shown that in sewage-polluted waters there is a decrease in the coliform bacterial content of oysters associated with this hibernation (Hunter and Harrison, 1928). According to

Fisher and Acker (1935) the coliform content of water is less in winter than in late fall; "a marked improvement in the quality of oysters occurs within 1° C. of the freezing point" and "this improvement was much more consistent at these lower ranges of temperature than at any other cold-weather ranges."

In 1925 the U. S. Public Health Service Committee on Sanitary Control of the Shellfish Industry recognized hibernation as a factor of safety and stated that it might be utilized when the water temperatures fell to 5° C. or lower. This principle did not, however, receive general application in the United States.

In Canadian Atlantic oyster areas the water temperatures remain continuously below 0° C. for a considerable period each winter, during most of which the inlets are covered by ice. The conditions for the use of hibernation as a factor of safety are, therefore, much better than in warmer countries. Temperatures approaching the threshold of feeding activity (5° C.), and in our opinion too close to it for safety, were included in the hibernation period as tentatively applied in the United States. This was probably responsible for the apparent unreliability of the principle and, consequently, for its rejection there. Because of longer periods of

TABLE 1  
Summary of Data

Date	M.P.N. of Coliform Organisms per 100 ml. of:										Tidal Phase at Time of Sampling	Salinity p.p.t. at Depths	Water Temp. (Avg. for 3 Depths) ° C.	Summary of Weather Observations
	Oysters		Water		Oysters		Water		Oysters					
	1	2	3	4	5	6	7	8	9	10				
1940														
Sept. 13	460	860	860				140			H.F.		16	Rain; moderate N.	
14													Clear; moderate S.W.	
16-17	1,860	240	22,000	460	180	1,500+	1,860	93		L.R.	8	24	Heavy E. gale and rain	
20	460	150	300	93	180	460	180	210		L.S.	11	22	Clear; calm	
21-22													Heavy rains; moderate N.	
23	0	23	300	15	30,000+	150	1,860	1,100		½ R.			Clear; fresh N.W.	
24-25	830	1,500+	9,200	1,500+	1,860	1,500+	460	1,500+		L.F.	4	7	Heavy rain; S.W. gale in night	
25-26	460	93	300	150	180	1,500+	300	93		½ F.	10	24	Rain; moderate S.E.	
27	860	93	180	43	1,860	240	460	75		R.	20	24	Rain; fresh N.E.	
28-29	180	23	0	93	1,860	240	1,860	240		L.R.	17	23	Clear; light S.W.	
30	80	23	140	23	80	9	80	93		L.F.	18	19	Clear; light N.E.	
Oct. 1	180	43	860	43	460	3	3,000	23		H.F.	19	18	Cloudy; strong N.E.	
2	0	28	80	9	4,800	75	460	15		L.R.	19	23	Clear; light W. and N.W.	
3	60	7	180	93	860	43	300	93		H.F.	23	26	Clear; moderate S.W.	
4	80	9	80	23	1,860	460	460	43		H.R.	23	26	Rain; fresh N.W.	
5-6	0	43	0	15	60	9	0	93		H.S.	23	24	Heavy rain; light N.W.	
7	0	240	0	23	0	240	180	43		L.R.	18	23	Clear; light N.W.	
8	0	43	0	43	80	460	0	150		H.F.	17	26	Clear; light N.W.	
9	0	150	80	23	0	1,100	180	23		H.F.	16	27	Clear; light S.W.	
10													Cloudy; with snow; mod. N.E. & N.W.	
11													Cloudy; light N.W.	
12-13														
14														
15														
16														
17-18														
18														
19-20														
21														
22														
23														
24														
25														
26-27														
28														

29	0	15	0	9	0	43	0	0	4	H.R.	15	27	3.9	Bright; moderate N.
30	0	0	0	3	0	11	0	0	3	H.R.	18	26	3.4	Clear; light N.W.
31	0	0	0	0	0	0	0	0	0					Cloudy; light N.E.
Nov. 1-2														Clear and calm.
3	0	460	0	75	0	23	80	0	23	L.R.	19	22	4.6	Rain; fresh S.W.
4	0	0	0	0	0	0	0	0	0					Cloudy; strong S.W.
5	0	23	0	75	80	43	0	0	43	L.R.	21	26	..	Clear; moderate N.W.
6	0	0	0	0	0	0	0	0	0					Cloudy; light S.E.
7	0	23	0	93	0	15	0	0	11	H.F.	19	24	4.9	Cloudy; mod. N.W.; light rain
8	0	0	0	0	0	0	0	0	0					Dull; moderate S.W.
9	0	0	0	0	0	0	0	0	0					Clear; moderate N.W.
10	0	15	0	0	80	15	460	0	15	H.R.	19	26	4.1	Light N.E.; snow
11	0	0	0	0	180	20	0	0	460	L.R.	21	24	6.4	Dull; light N.W.; rain at night
12	140	0	0	9	0	0	0	0	0					Rain in evening
13	180	240	180	240	0	1,100	0	0	240	H.R.	11	18	5.1	Dull; light W.
14	80	43	860	23	80	93	860	0	23	H.R.	17	24	4.3	Rain; strong N.E.
15	180	93	460	1,100	180	93	460	0	93	{L.S. (very low) L.F.	9	17	3.2	Rain; strong N.E.
16	0	23	0	150	0	43	0	0	0					Cloudy; moderate N.W.
17	80	0	80	9	80	23	0	0	4	H.S.	12	23	2.0	Clear; moderate N.W.
18	0	0	0	0	0	0	0	0	0					Rain; fresh S.W.
19	0	0	0	0	0	0	0	0	0					Clear; moderate N.W.
20	0	0	0	0	0	0	0	0	0					Rain; light S.E.
21	0	0	0	0	0	0	0	0	0					Clear; moderate winds
22	0	0	0	0	0	0	0	0	0					Light snow; light N.E.
23-24	80	0	80	9	80	23	0	0	4	H.S.	12	23	2.0	Clear; fresh winds; ice formed
25	0	0	0	0	0	0	0	0	0					Much snow
26	0	0	0	0	0	0	0	0	0					Snow and moderate winds
27-30	0	0	0	0	0	0	0	0	0					Snowing; moderate N.E.
Dec. 2	0	0	0	21	80	23	0	0	75	H.R.	20	23	-0	Clear; light W.
4	0	0	0	23	140	15	0	0	23	L.F.	15	16	-0	Clear; moderate E.
6	0	0	0	9	0	21	0	0	75	H.R.	16	23	-0	Clear; light N.W.
9	0	0	0	43	0	43	0	0	23	H.S.	18	22	-0	Clear; light N.W.
1941														
Jan. 15	0	4	0	9	0	0	0	0	23	L.F.	..	..	..	Clear; very cold
16	0	0	0	43	0	23	0	0	150	L.F.	5	22	-1.3	Clear; cold
17	0	0	0	15	0	23	0	0	150	L.F.	..	..	..	Snowing; mild
20	0	0	0	7	0	93	0	0	9	L.R.	25	28	-1.3	Mild

## LEGEND

P.n.t. = parts per thousand

Mod. = Moderate

N. = North

S. = South

E. = East

W. = West

R. = Rising

F. = Falling

H. = High

L. = Low

S. = Slack

M.P.N. = Most Probable number

Phase of Tide at Time of Sampling:

cold water in Canadian Atlantic oyster areas, it is unnecessary to include such temperatures, or, indeed, any above  $0^{\circ}\text{C.}$ , in the period during which hibernation may be considered as a factor of safety.

#### LOCALE

Buctouche, N. B., harbor was selected for this study because it is one of our more important natural oyster producing areas and had been shown on previous surveys to be subject to a fairly high degree of pollution. Oyster beds close to the village were considered potentially dangerous, but complete prohibition of fishing on them would cause serious economic hardship to local fishermen. An investigation of the coliform content of hibernating oysters had, therefore, an immediate practical significance in this locality.

The topography of the area is indicated in Figures 1 and 2. Although the population of the village is only about 1,000 and sewage from only a small proportion of the population flows directly into the estuary, surface drainage from higher levels through the

village is also important. The impervious nature of the soil aids rather than prevents pollution from reaching the river. A number of dwellings of a poor sort close to the water at the up-river end of the village and boats at the wharf add to the pollution. As a result the areas close to the village must be considered too dangerously polluted to permit the direct marketing of oysters during open water. This is shown by the bacteriological data given below (Table 1).

#### METHODS

Bacteriological examinations of oysters and of overlying waters, and the recording of meteorological and hydrographic data, were commenced at the middle of September and continued until December 9 when the ice had formed for the winter. The investigation was resumed for a short period in January in order to determine conditions after water temperatures had been below  $0^{\circ}\text{C.}$  for a considerable period.

Samples of oysters and of the overlying water (approximately 1 ft. off the bottom) were taken 3 times a week

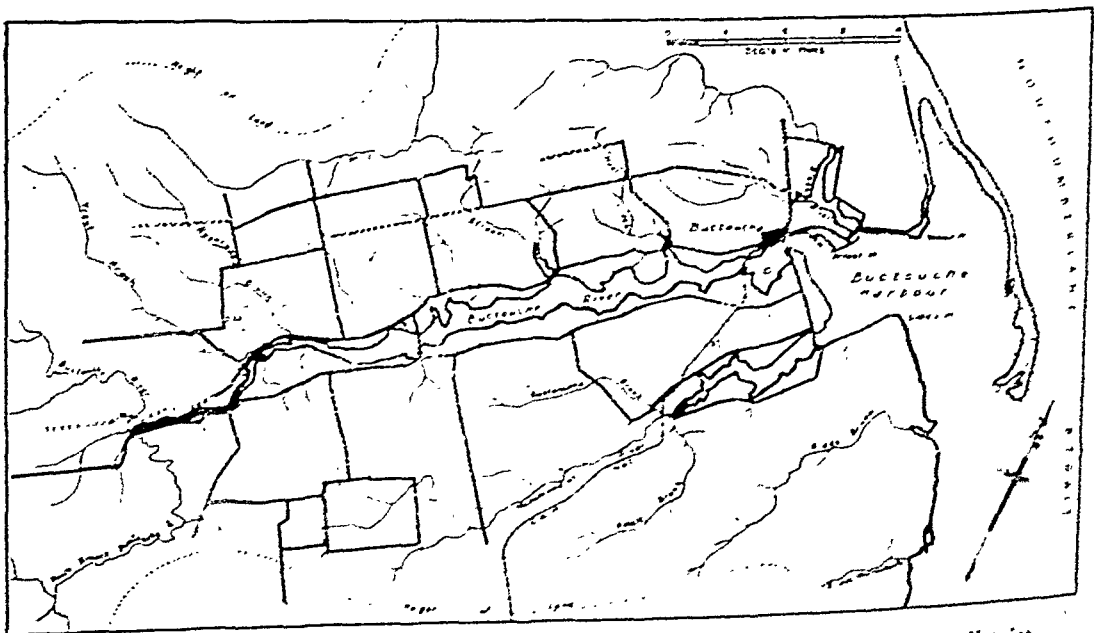


FIGURE 1—Chart showing topographical features of the Buctouche, N. B., district

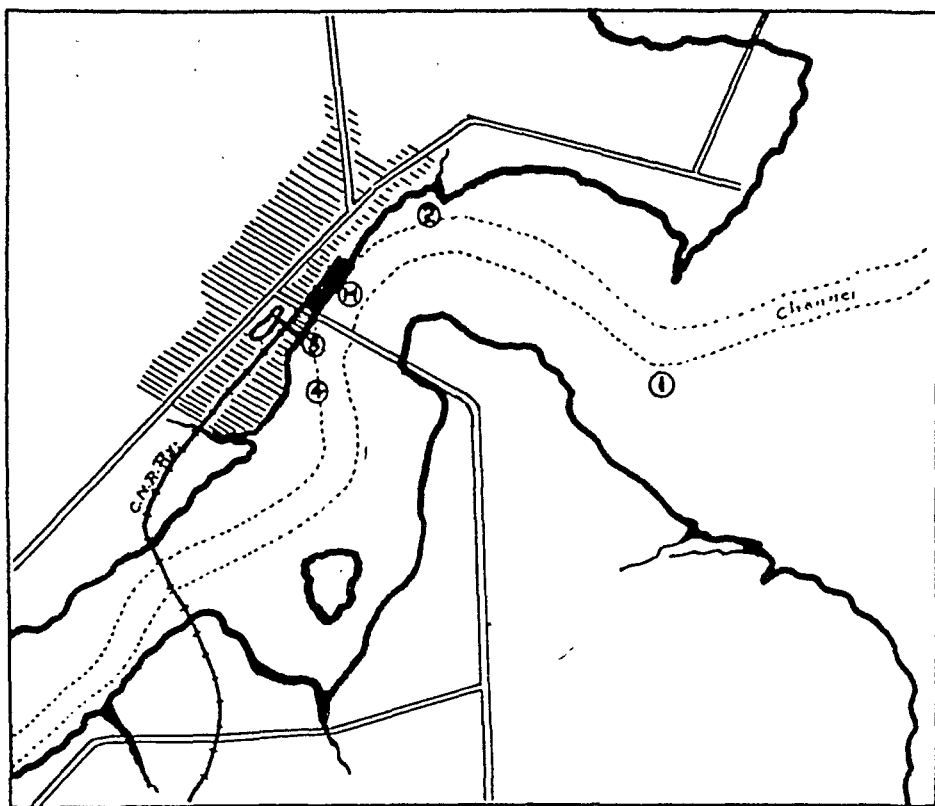


FIGURE 2—Chart showing the positions of the four sampling stations and the hydrographic station (H), in relation to the village of Buctouche (hatched).

at the 4 stations indicated in Figure 2. The positions of the stations in relation to the source of pollution have a direct bearing upon the results. Station 1 was farthest from the source of pollution, station 2 nearer but still at a distance, station 3 opposite the outlet of a cesspool, and station 4 just upstream from the outlets of several smaller sewers. At stations 1 and 3 the depths were 6 to 10 ft., and at 2 and 4, 15 to 25 ft. The hydrographic station was at the wharf where the water was 30 ft. deep. Water temperature readings and salinity samples were taken at three levels—surface, 8 ft. and 20 ft.—at the time of sampling. At the same time the phase of the tide was recorded.

The bacteriological methods employed were those outlined in the *Tentative Standard Procedure for the Bacteriological Examination of Shellfish and Shellfish Waters* of the American Public

Health Association, December, 1940. All the bacteriological work was performed in the mobile laboratory of the Department of Pensions and National Health. Samples collected during the morning of each day were placed on test during the afternoon. During the winter the oyster samples were taken to the laboratory in pails containing water from the bay to prevent them from freezing. Three tubes were inoculated with each of three dilutions, and probable numbers of coliform organisms per 100 ml. were calculated.

#### RESULTS

Table 1 summarizes the data collected and Figure 3 illustrates the relationship of oyster pollution to water temperature and water pollution at station 2.

*Effect of weather on the coliform content of the water*—The data show

that great variations occurred in the coliform content of the water, and indicate that weather is an important factor. It may be seen that high values, such as occurred on September 20 and 27, October 11, and November 15, were preceded by heavy rain and wind. Rain, by increasing surface drainage, increases the volume of pollution entering the inlet. This in turn is reflected in a reduction of surface salinities. Heavy winds tend to keep pollution in suspension, but once the

bay is protected by ice, the stirring by winds is prevented.

The investigation did not clearly reveal the influence of other factors on pollution of the water until the onset of cold weather. Much surface drainage was then eliminated by freezing and one of the major sources of pollution thus removed. The data in the table show that the coliform content of the water fell to a comparatively low and constant level at about the same time as ice was formed on the inlet. The

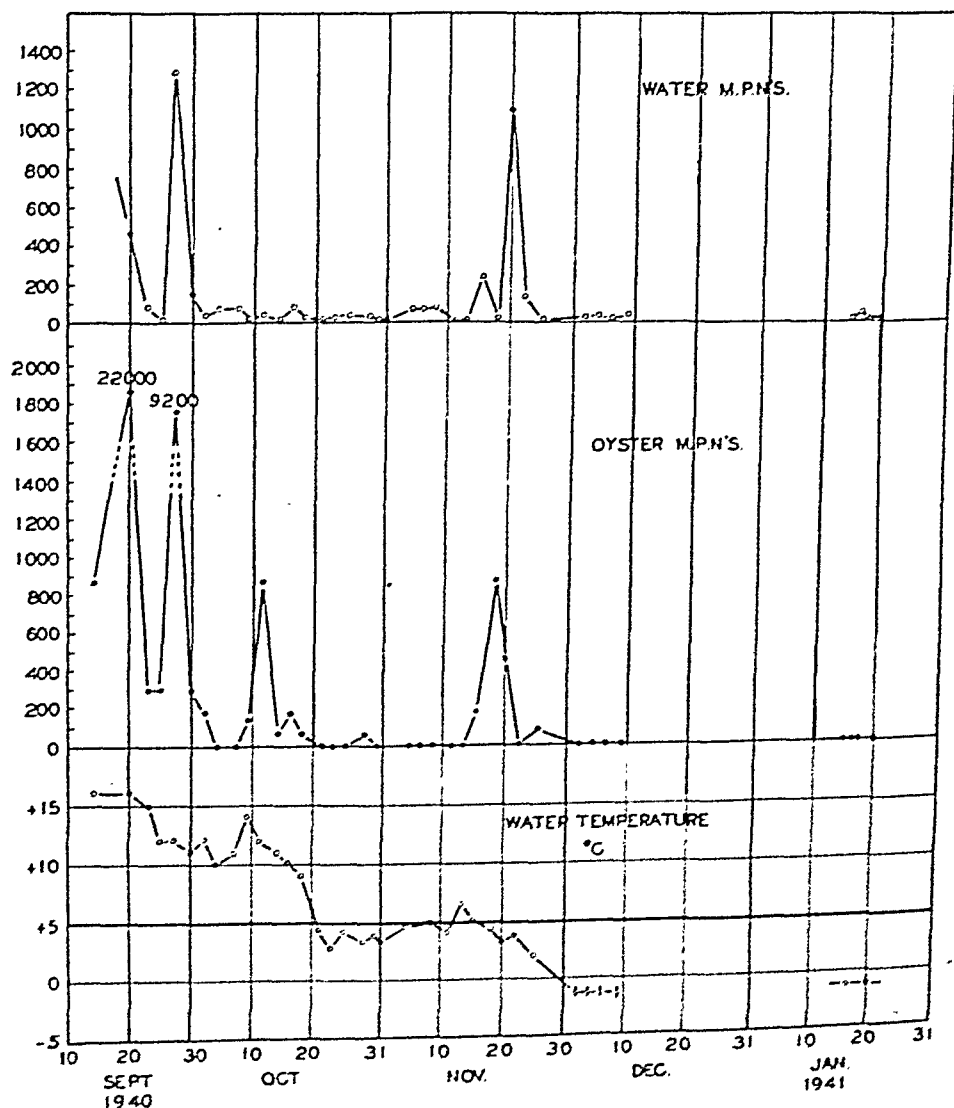


FIGURE 3—Showing water temperatures at the hydrographic station and most probable numbers of coliform organisms (M.P.N.'s) per 100 ml. of water and oyster meats at station 2

latter occurred on November 26 and would approximate the time when surface drainage was measurably reduced by frost.

*Correlation of coliform content of water and of oysters during warm weather*—The variations in the coliform content of the oysters were roughly parallel to those of the water up to October 21 when the water first became too cold for active feeding. This indicates that the coliform content of the oysters is both increased and decreased rapidly under such conditions and, therefore, quickly influenced by that of the water.

*Influence of low temperatures—hibernation*—After October 21 the temperature of the water rather than its coliform content became the controlling factor in the pollution of the oysters. On that date it fell from about 9° to 4° C. as a result of a heavy snow storm. The coliform content of the oysters suddenly disappeared for a considerable period in spite of the fact that the water remained polluted. Water temperatures again rose to 6° C. on November 13 and the oysters again became polluted. After this date the temperatures fell away again but this time very gradually. The accompanying decrease in the contamination of the oysters was likewise very gradual but it had disappeared, except at station 3, by the end of the month. The suddenness of the temperature decline may be of importance in regulating the speed of the self-purification of the oysters.

*Importance of very low temperatures*—Although water pollution persisted throughout the investigation, the table shows that no coliform bacteria could be demonstrated in the oysters after the temperature had fallen below 0° C. for a few days. This applies even to

station 3 where the oysters were subject to the worst pollution. Extensive hydrographic data on a similar inlet show that after the ice has formed the temperatures remain below 0° C. for the rest of the winter (Needler, 1941). There is, therefore, reason to believe that mid-winter conditions are stable and that the observations made in January are representative.

The data clearly indicate the absence of coliform bacteria from oysters when the temperatures are below 0° C. This is contrasted with a variable, though usually low, content when the temperatures are below but near the threshold for feeding activity, 5° C. This confirms the findings of Fisher and Acker (1935) cited above. In Canadian waters, where sub-zero temperatures occur in all oyster producing inlets for about 3 months or more, hibernation can contribute to the safe utilization of oysters to a greater degree than in waters where such low temperatures do not prevail for any considerable period. Although some areas are so grossly polluted that oysters could not be used safely at any time, others which are dangerously polluted in warmer weather can be considered safe when covered by ice.

*Time required for hibernation to become effective*—The data indicate that when the water temperature first fell below 0° C. there was a quick effect on the coliform content of the oysters. On the other hand, it was still demonstrable in oysters at station 3 for at least 2 days after the temperature fell below 0° C. Thus, the coliform content does not disappear immediately after such temperatures are reached. For greatest safety it seems wise to obtain the full effects of the sub-zero temperatures by postponing commencement of the winter fishing until at least 2 weeks after final formation of the ice.



TABLE 1

*The Prevalence of Various Pneumococcus Types in the Children on the Medical Ward*

Type *	Number of Children	Per cent of Children	Number of Cultures	Per cent of Cultures
14	50	32.4	143	26.2
19	42	27.3	102	18.6
6	31	20.1	69	12.6
18	21	13.6	45	8.3
23	15	9.7	23	4.2
16	14	9.1	22	4.1
3	14	9.1	22	4.1
1	9	5.6	18	3.3
Others	54	35.1	97	17.7
Total		†		100.0

\* For purposes of simplicity, we have used the Arabic rather than the Roman numerals in designating pneumococcus types.

† Does not total 100 per cent, since some of the children harbored more than one strain.

presence of those higher strains that are encountered infrequently is especially significant, and therefore have omitted them from the table.

There is one outstanding feature of Table 1: the high prevalence of Type 14 pneumococcus in the throats of the children on the medical wards. We know that Type 14 pneumococcus is the most frequent and most serious cause of pneumonia in babies. This strain is encountered infrequently in a normal population, and when it is found in the throat of a small child, one must consider it a danger signal.<sup>2</sup>

The relative prevalence of various types of pneumococci that are encountered in the throats of infants and children has been determined by various workers. Nemir and associates,<sup>3</sup> for example, have presented the data given in the first column of Table 2. We have compared the prevalence of the various common types of pneumococci encountered in our series (shown in column 2) with Nemir's data. The percentages show clearly that the only outstanding feature of our series is the high prevalence of Type 14 pneumococcus. Our own previous studies of pneumococcus incidence in normal per-

sons living at home,<sup>1</sup> which included both adults and children, indicate that the normal prevalence of Type 14 pneumococcus in the control families is approximately 3 per cent. This is comparable to Nemir's data.

Thus, in the present studies, Type 14 pneumococcus showed a prevalence of nearly ten times the normal expectancy. In fact, the prevalence of this type in the present study compares very closely with the relative prevalence of Type 14 in previous studies of series of actual cases of pneumonia that have occurred in children under 2 years of age. Curren,<sup>2</sup> for example, in a study of a series of 600 pneumonia patients between 2 and 12 years of age, found that 25 per cent of the children with pneumonia were infected with Type 14 pneumococcus.

This analysis of the preliminary data makes it quite evident that it is necessary for us to explain the source of Type 14 pneumococcus in the ward, and to determine the cause of its presence there.

A study of the clinical condition of the children who were admitted to the medical ward gave us some inkling as to the reason for the high prevalence of Type 14 pneumococcus. Long and his coworkers,<sup>4</sup> in their studies of the nasopharyngeal flora of infants at the Boston Infants' Hospital, noted that Type 14 pneumococcus was prevalent not only in cases of pneumonia, but was encountered also frequently in infants with upper respiratory infections. They state that Type 14 was not found in the throats of normal babies. In our

TABLE 2

*Prevalence of Pneumococcus Types Commonly Encountered in Infants and Children*

Type	Per cent in Nemir's Series	Per cent in Our Own Series
6	17.1	20.1
19	12.9	27.3
18	6.3	13.6
3	6.6	9.1
14	4.7	32.4

series, 114 of the 154 patients studied had some form of acute respiratory infection during their stay in the medical wards. It seemed quite possible that the Type 14 pneumococcus was prevalent because it was associated with acute respiratory infections other than pneumonia. An analysis of the incidence of Type 14 pneumococcus in acute respiratory illness is given in Table 3.

TABLE 3

*Prevalence of Type 14 Pneumococcus in Children with Respiratory Disease on the Medical Wards*

	No. Cases	No. with Type 14
Sick Children		
Those with Pneumonia	31	10
Those with Other Acute Respiratory Illness	83	30
Controls		
Children with No Respiratory Illness	40	10
Nurses Caring for the Children on the Wards	62	6

Table 3 shows that in one-third of the children with pneumonia, Type 14 was the presumable cause of the infection. The incidence of Type 14 pneumococcus in the children with other respiratory infections was equally high. At first, this seemed very important and significant, until we observed that one-fourth of the normal children also carried a Type 14.

In addition to the cultures taken on the children, we also obtained a series of cultures from nurses and physicians who cared for the children on the medical wards. Most of the nurses were on an affiliation basis: thus, they worked on the wards of the hospital for a few weeks only. This resulted in a constant change in the nursing personnel, so that it was not possible to follow the nurses with serial throat cultures for any length of time. From the total of 62 nurses cultured, 6 were found to be carrying Type 14 pneumococcus. In no instance was the infection in the nurse

associated with pneumonia, or even with mild respiratory infection.

It is quite clear from Table 3 that there is no statistically significant difference in the prevalence of Type 14 pneumococcus in individuals who did or who did not have respiratory disease. This was a most baffling situation. One explanation might be that Type 14 was a relatively innocuous strain of pneumococcus that had simply seeded itself down in a group of children without causing any particular trouble. It was found in the throats of children with pneumonia and other respiratory diseases simply as a more or less harmless concomitant, and bore little or no relationship to the infective process. We did not believe this hypothesis to be the correct one, but we had no proof to the contrary.

During the course of our investigation in the hospital ward, we had noted that a considerable number of children with respiratory infections were being admitted to the ward from a common source—Nursery 6. This nursery, situated in a distant wing of the institution, was planned to care for normal babies that were awaiting placement in foster homes. Whenever a child in the nursery became ill, he was transferred to the hospital.

When we began our work on the medical ward, we found 6 children on the ward who had been admitted from Nursery 6 from one week to one month previous to the beginning of our study. Each of these children gave a history of acute respiratory infection, followed by otitis media. One had had severe conjunctivitis and 3 had had pneumonia. Each of these children was practically recovered from his acute illness when we began our work; nevertheless, 4 of the 6 had Type 14 pneumococcus in the throat at the time we made our first series of cultures. As our work progressed, we noted that children were being admitted to the medical ward in

increasing numbers from Nursery 6, all with respiratory infections. Five children, for example, were admitted from Nursery 6 with otitis media. The illness began with an acute respiratory infection, which was soon complicated by more serious and extensive symptoms. In each of these 5 children, Type 14 pneumococcus was obtained from the discharging ears or from the throat. We noted also that all these children had resided in the nursery for more than 20 days prior to the onset of illness.

Six other babies were admitted from Nursery 6 to the medical ward with pneumonia, and in 5 of them the pneumonia was associated with a Type 14 pneumococcus. This high prevalence of Type 14 pneumococcus in the children who were transferred from Nursery 6 to the medical wards indicated that it would be wise to look to the nursery as a possible source of invasion of the medical wards with Type 14 pneumococcus.

#### STUDIES IN NURSERY 6

We first appreciated the importance of Nursery 6 as a focus of infection with Type 14 pneumococcus about the first week of March. It became increasingly clear that here, in this nursery, was an important source of infection with this strain; and therefore we began to study the prevalence of Type 14 pneumococcus among the normal children in the nursery on March 11, and continued observations in this nursery through July 29.

This nursery covered an entire floor in another wing, and was composed of 8 rooms with from 2 to 12 beds in each room, a total of 63 beds. These beds were not separated by partitions; otherwise the medical and nursing care was essentially the same as on the medical floor. The children were cared for by student nurses who were on an affiliation basis, and who came and went in

much the same manner as we have already described on the medical ward.

The population of the nursery was changing continually. Well children were brought into the nursery and kept there until they could be boarded out in foster homes or returned to their parents. New children who were admitted remained only so long as was absolutely necessary to arrange for foster care. Whenever a child became ill, he was, of course, transferred to the medical ward. The ages of the children in the nursery ranged between 3 months and 9 years: 60 per cent were less than 2 years of age, and 30 per cent from 2 to 5 years of age. There was a good deal of shifting about of the children in the nursery. One child did not stay in the same bed or the same room for any length of time. This continuous movement of the children made it impossible to determine each individual's contacts. It did aid our study, in that it gave ample opportunity for frequent transfer of existing infection from one child to another, as later evidence clearly indicated.

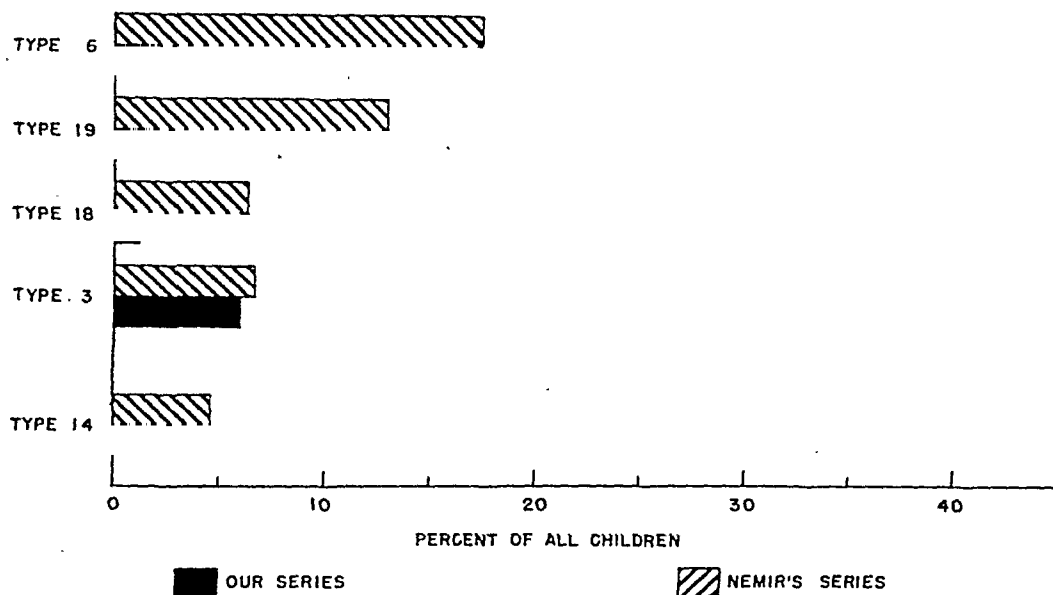
During the entire period of study in the nursery, 150 children were enrolled. The throats of all were cultured within a week after admission, and serial cultures were repeated on each child at least every fortnight. Four hundred and thirty-one throat cultures were made on these children, of which 81.5 per cent were positive for pneumococci. All told, 493 strains of pneumococci were found. The number is accounted for, of course, because in some instances a child harbored more than one type. The distribution of the pneumococci among the 150 children in the nursery is given in Chart 1. Practically all the higher types were found, but were present in such a small proportion of the cases that we did not consider it of sufficient interest and importance to include them in this chart.

Chart 1 indicates quite clearly that

CHART 1

PREVALENCE OF PNEUMOCOCCUS TYPES  
AMONG CHILDREN IN NURSERY SIX

COMPARED WITH NEMIR'S SERIES OF NORMAL CHILDREN



the prevalence and the distribution of the various types of pneumococci in the nursery was similar to the distribution that we encountered in the medical ward. Type 14 was by far the most prevalent strain; other types of pneumococci were encountered in approximately normal proportions and in the same order of distribution as encountered in the medical ward.

The most striking thing about our studies in the nursery was that nearly half the children—45 per cent—carried a Type 14 pneumococcus at one time or another. These results are very different from the findings of other authors, and also from our own previous studies, all of which have indicated that Type 14 is *rarely* encountered in the throats of normal children. This point is most significant. It is generally recognized, as we have previously stated, that Type 14 pneumococcus is the most important factor in the production of pneumonia in children. High prevalence

of this strain should be a matter of serious import.

Yet we had ample evidence that a virulent Type 14 pneumococcus had invaded a community of normal children without producing any symptoms. But it might be of potential danger. It is possible to imagine that some other factor might then enter this community, which is infected with a virulent but dormant strain of pneumococcus, and act as a fuse which would set off an explosion of serious respiratory disease. Normal children might harbor the virulent Type 14 pneumococcus for some time without ill effect, but some other factor might lower the resistance, general or local, of the child harboring this strain to such a degree that the virulent pneumococcus, which is resting unobtrusively in the throat, would flare up suddenly and produce serious symptoms.

We believe this hypothesis to be correct. It seems probable that the factor which was responsible for lowering the

In case 6, cultures were taken from the child within 4 days after admission, and she was found to be already harboring

SERIES OF CULTURES FROM 15 CHILDREN

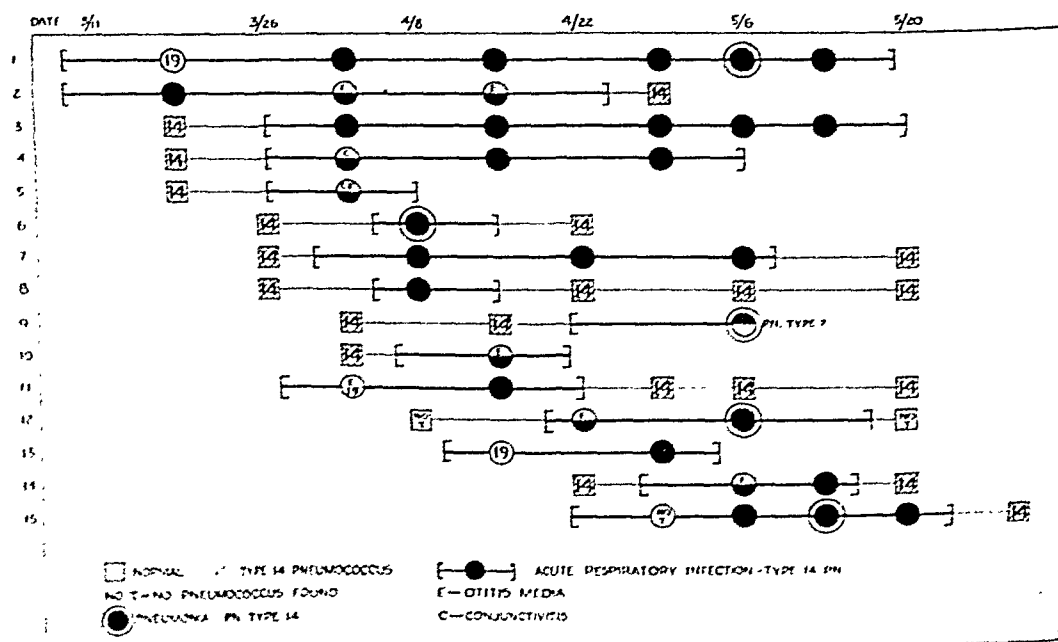
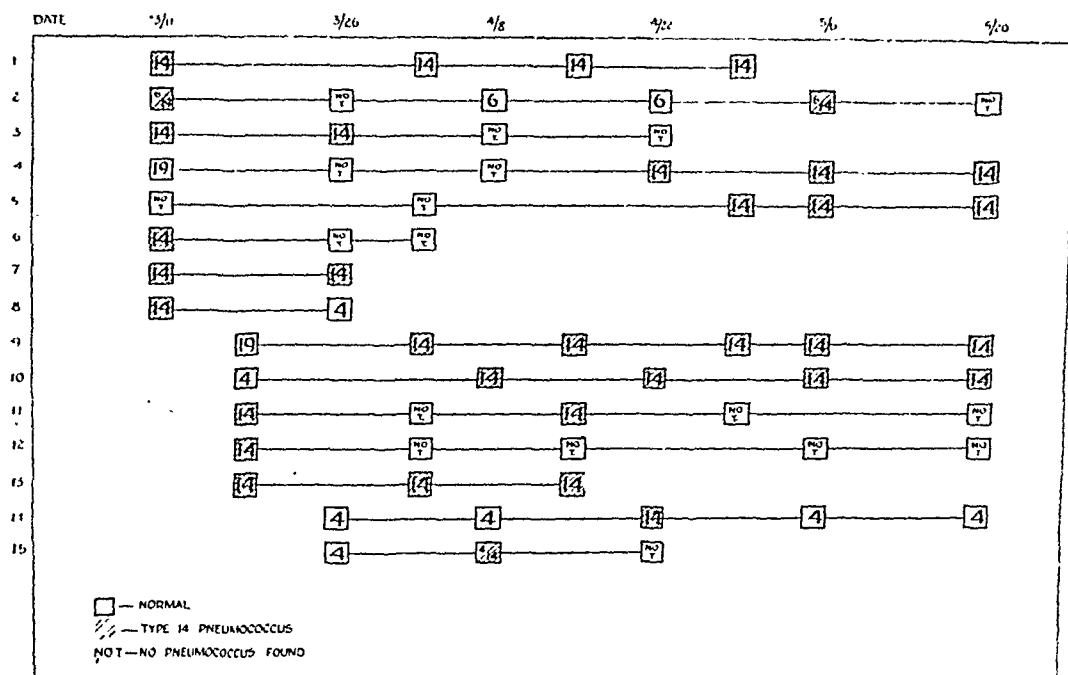


CHART 3

CONTROL SERIES OF CULTURES FROM 15 CHILDREN  
IN NURSERY G  
WHO HAD NO COLDS.



a Type 14 pneumococcus. Acute respiratory symptoms began on April 3, and on April 8 pneumonia developed. The sputum showed large numbers of Type 14 pneumococci. The child returned to normal about April 18, but cultures from the throat taken on the 22nd still showed Type 14 pneumococcus.

These observations on the two cases that we have described are quite typical of the results obtained in all the children whose serial cultures are illustrated in Chart 2. Type 14 pneumococcus did not seem to initiate a respiratory infection, but if a respiratory infection occurred in the presence of this organism, the strain found a fertile soil for invasion of and multiplication in the deep tissues.

Chart 3 illustrates the results of serial throat cultures upon 15 normal children who spent some time in the nursery. They acquired Type 14 pneumococcus, usually within one or two weeks after

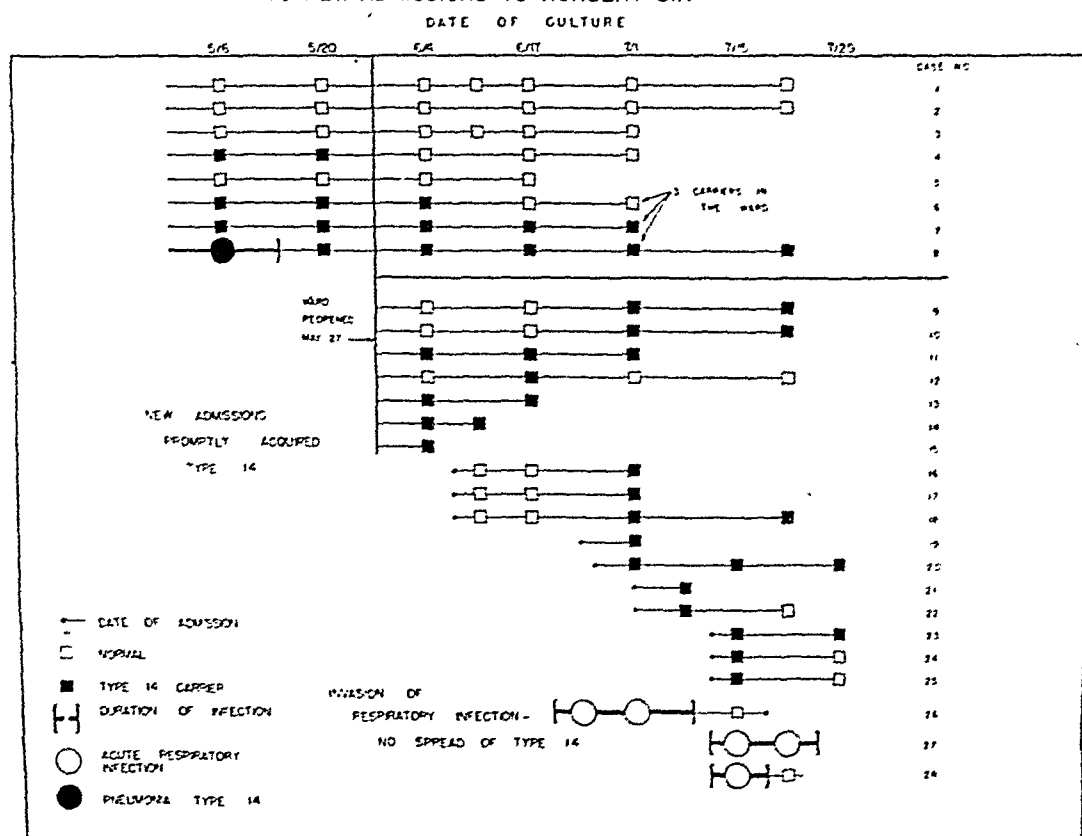
admission, and carried the virulent strain, often for many weeks, without apparent ill effect. None of this group developed an acute respiratory infection. The Type 14 pneumococcus caused these children no apparent harm.

These two charts show that the prevalence of Type 14 pneumococcus was almost exactly the same in the well children as in the group of children who suffered from respiratory disease. Thus, it may be argued that the Type 14 pneumococcus was a harmless concomitant invader, and played no part in the respiratory infections of the group.

We do not believe that this is true, since, in the children who were ill, Type 14 was found in very large numbers, often in pure culture, in the purulent secretions from the ears, the conjunctivæ, the bronchi, and the lungs. Type 14 was present frequently in normal children, but often it occurred in such small numbers that it was difficult to find.

CHART 4

SPREAD OF TYPE 14 PNEUMOCOCCUS  
TO NEW ADMISSIONS TO NURSERY SIX



TRANSMISSION OF TYPE 14 PNEUMO-  
COCCUS IN A CLOSED COMMUNITY

In the late spring we had an excellent opportunity to study the invasiveness of Type 14 pneumococcus under epidemiological conditions that resemble closely the classical controlled laboratory experiments in epidemiology of Greenwood, Topley, and Wilson.

Nursery 6 was closed to new admissions on April 25 because of an outbreak of chicken pox. Nine children remained in the nursery: all had been carriers of Type 14 pneumococcus at some time during the winter, and one had had pneumonia. Gradually, the Type 14 pneumococci disappeared, so that on May 21, when the nursery was reopened to new admissions, there were only 3 Type 14 carriers in the group.

We obtained serial cultures on each new admission to the nursery during

June and July, and maintained serial cultures on the original group. The results of this study are shown in Chart 4. The chart shows that every newly admitted child acquired Type 14 pneumococcus within a month after admission. Some picked up the infection at once. In others, the infection did not occur for 2 or 3 weeks. The children from the original group who had harbored Type 14 during the winter and had lost it did not pick it up again.

Three children were admitted to the nursery during June and July with acute respiratory infections. This illness did not spread to the occupants of the nursery who were harboring Type 14 pneumococcus, nor did the children with the acute respiratory infection acquire the virulent Type 14 pneumococcus. One may conjecture that the season of the year was the important

factor in prevention of the spread of respiratory illness in the nursery at this time. If respiratory infection had been introduced into this situation in the fall or winter, we believe that the results might have been different.

#### SUMMARY

Type 14 pneumococcus invaded a group of normal children in Nursery 6 of the institution, probably in the early fall of 1939. This virulent strain, which is generally recognized as the most important cause of pneumonia in babies, caused no apparent harm to its host unless the individual developed an acute respiratory infection. When this occurred, the dormant pneumococcus at once invaded the tissues of the throat, and in some instances spread to the middle ears, the conjunctivae, bronchi, and the lungs.

Children from Nursery 6 who became ill were sent to the hospital ward. They brought Type 14 pneumococci with them. The strain spread throughout the medical ward, infecting most of the children on the ward at one time or another. If a child who had Type 14 pneumococcus in his throat developed a respiratory infection, the results were frequently quite serious.

This is the first instance in which we have encountered a high prevalence of a virulent pneumococcus strain in a community *in advance of the onset of illness in those who were carrying the strain.*

The studies suggest that a virulent strain of pneumococcus may enter a community, permeate it, invade many individuals, and linger for a considerable time without causing any apparent harm. Some untoward factor may then enter the picture (such as an acute respiratory infection) which will lower the resistance of the carrier of the virulent pneumococcus strain to such a degree that the strain will invade the tissues of the body and produce a serious illness.

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# Working for Better Nutrition in a Rural Community\*

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WORCESTER COUNTY, Md., is typical of the Eastern Shore area of that state, conservative and provincial, but favored with diversified crops and ample food resources. There is no reason why there should be a nutrition problem except that many of the 14,000 white and 7,000 colored inhabitants are poor and ignorant, and have large families. The possibility of fruitful nutrition work, other than in infant feeding, was scarcely considered by the health department personnel until the state nutritionists enabled them to visualize the existing problem and to learn some of the practicable technics for nutrition teaching and promotion.

A school lunch program was believed to be the most dramatic and tangible way to start work for better nutrition. However, it was decided to include educational work with prenatal patients and with family units. It was also decided to provide certain food supplements, if possible.

## SCHOOL LUNCH PROGRAM

In examining the school lunch program as it then existed in the county, it was noted that only 7 of the 23 schools had any type of lunch program, and in only 2 of these was it customary to provide free lunches for children from indigent families. The lunch program varied

from a single hot dish and sandwiches to a modern cafeteria service. Thus it was apparent that much room for work existed in schools; but evidence was needed of an existing nutritional problem in order to "sell" the community.

*Dietary Survey*—One of the earlier efforts was to define the magnitude of the nutritional problem among school children by means of a dietary survey. The data were recorded on a mimeographed sheet, listing a detailed inventory of the child's food consumption the previous day. A factor of error was granted, and a seasonal influence, but the nurses were sufficiently impressed by the results of the survey to consider the picture it revealed as essentially correct.

The findings more than confirmed the impression of poor dietary habits and the existence of a nutritional problem. For example, on the day of the survey during the winter, only 41 per cent of the children had two or more cups of milk; only 19 per cent had a diet adequate for vegetables other than potato; only 20 per cent had an adequate diet for fruits; 41 per cent for cereal or whole grain; but 97 per cent for meat. The others had either inadequate amounts or none at all of these various types of food. It was of further interest to learn that only 7.6 per cent of the children had a diet adequate in all five factors studied; 23 per cent were totally deficient in one factor; 35 per cent in two; 27 per cent in three, and 7.5 per cent in four. It was believed that such results with 1,169 school children must be significant.

\* Read at a Joint Session of the American School Health Association and the Health Officers, Food and Nutrition, Maternal and Child Health, and the Public Health Nursing Sections of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 14, 1941.

To secure the basic data the coöperation of parents was enlisted in interviewing the younger children, grades 1-6. Above this grade the children filled out the forms as a classroom exercise. A nurse demonstrated the technic of an interview and supervised the work. The women who helped, and many of them were used, were impressed by the dietary picture revealed. For some the experience was emotionally moving, and lost none of its power as it traveled around the county at bridge clubs, church guild meetings, etc. The findings themselves and the propaganda created by the interviewers did more than anything else to marshall effective support for a school lunch program.

Other familiar promotional technics were utilized, such as programs at public meetings, newspaper articles, and exhibits.

The health department assisted in translating the community interest and support into action; however, it was left to the schools to assume the responsibility for the school lunch programs.

*Supplies, Equipment, and Personnel*—The question of supplies and equipment for schools just starting lunch programs was the least of the problems. These were made available by the school boards and by contributions of community organizations and individuals. It was believed that contributions by the local public health association, particularly if they could be made on a matching basis, would help and stimulate those schools with the poorest local resources. During the first year \$100 was set aside for this purpose. For the future, it was planned that the public health association would be employed as a purchasing agency, particularly for small schools operating on a financial shoestring, and thus enable them to save money by buying in quantity.

The use of surplus commodities proved a powerful weapon in making possible a school lunch program, but it took about a year to work out a satisfactory modification of the regulations governing the distribution of these commodities. At the time our work began it was permissible to use them only in free lunches. The school was obligated to purchase identical supplies for use in paid lunches. Since the commodities were seldom sufficiently varied to permit the preparation of an entire lunch, it was, of course, necessary to supplement the surplus commodities for free lunches with other foods at the expense of the schools. Under these conditions the use of surplus commodities was not particularly helpful. Finally, the regulations were so modified that the commodities could be used for all lunches, free and pay, with the school providing supplementary foods for free lunches of a value at least equal to the surplus commodities accepted. When this was done, surplus commodities were acceptable to the school board and proved most useful in encouraging the lunch program.

Several resources were tapped for labor. Some of the larger schools secured cafeteria managers and workers through the WPA, but it was difficult to find persons who could qualify for the WPA and who at the same time were acceptable for this work. Smaller schools received help through the NYA. Other schools used volunteer workers, teachers, pupils, and parents for voluntary or part voluntary services.

Certain sidelights are interesting. Especially in a year of poor prices, but also at other times, it is possible to obtain products free for the picking. It was only necessary to organize volunteer labor for the picking and facilities for canning. The parents of pupils in one school for colored children conducted a summer canning project, using products obtained in this way. Some

canneries will put up food at little cost if it is first prepared. Another colored school maintained a program for a year, depending largely on supplies carried by the children and donated from home. Through the public health association a county-wide solicitation of canned goods and staple vegetables was approved, but lack of promotional time made it impossible to inaugurate the drive. There is no doubt, however, that much food could have been secured in this way.

*Special Problems*—Little effort was made to combat the concession problem—*i.e.*, the sale of candy and soda water at lunch time in the school, but the need for doing so was recognized as an early “must.” Obviously, many children spent their money for these items instead of buying a nutritious lunch. The profits from these concessions often went to support school projects, such as purchase of athletic or auditorium equipment or library books. As such, the concession really represented a vested interest, and to combat it required tact and salesmanship. It was essential to sell schools on the idea, first, that profits from the lunch room should go back into the lunch program and that other projects must be financed in other ways; second, that if the lunch program really succeeded, there should be very little candy and soda water sold, and hence little if any profit from this source. A step in this direction made by some schools was the limiting of candy sales to a very short time near the end of the lunch hour.

Menus were poorly planned in some instances. This was particularly true in smaller schools with no home economics teachers and with such limited facilities that only a dish or two at most could be offered. For example, one school frequently limited its lunch to “hot dogs.” Some teachers needed supervision in the wise and economical

purchase of foods. For example, one school purchased fresh milk for cocoa when evaporated milk would have been cheaper and more convenient to handle.

It was also noted that certain types of surplus commodities were useless. Flour was one example if facilities for cooking, baking, or proper storage were not available. In other cases the teachers or cafeteria directors needed to learn how to use unfamiliar kinds of commodities.

Much of the food served free to children from indigent families was not eaten by children who were accustomed only to “hog meat” and potatoes. This represented waste, defeated the object of the free lunches, and had an unfavorable effect on the community. Supporters of the program tended to become discouraged when faced with such incidents. To combat this, the skillful teacher would discuss new and unusual dishes to be served for lunch in the classroom before the noon hour, explaining the value of such dishes. Efforts were made to establish a favorable group spirit among the pupils toward the school lunch—a technic that was often successful.

A further problem was the child who brought an unbalanced lunch from home. A home visit by the nurse or a PTA member might remedy this situation.

There was always the problem “who is eligible for a free lunch?” An eligibility committee, consisting of teachers, PTA members, nurses, and welfare workers worked out well.

It is our belief that most problems can be solved within the school by the teachers and pupils if they become sufficiently interested. Toward this end certain procedures were considered; such as school cafeteria committees, conducting institutes, and a periodic bulletin for teachers and cafeteria workers with nutrition news, teaching technics, and suggested menus. These

devices and patient personal contact work in time can solve most local problems.

#### THE PRENATAL PATIENT AND THE FAMILY UNIT

In addition to working on the school lunch program, other group activities in promoting nutrition were utilized. For example, the county home demonstration agent upon request visited the prenatal clinics, discussed nutrition with the patients, and demonstrated an appropriate dish. A home economics class for underprivileged women was conducted in one of the high school buildings, but for lack of attendance did not succeed.

In addition to these group activities, serious efforts were made to work with prenatal patients and with family units. For information on which to base their teaching, the nurses filled out dietary survey forms similar to those used in the school work. This was done when the patient or family was first admitted to service, or soon thereafter. The nurses would then follow up these patients on subsequent visits. This approach inevitably led to instruction in budgeting food money. Development of and adherence to a satisfactory budget was difficult to secure in families on a marginal and unstable income, and there were many such families. With those upon relief the aid of the welfare workers was solicited and obtained—this almost to the point of coercion with families of known irresponsibility. Even though few families were taught to budget adequately, considerable success was achieved in emphasizing the proportion of money to be spent for various types of food and in pointing out inexpensive types of food of high nutritional value. The nurses emphasized the value of home gardens, canning at home, storage pits for staple vegetables, and the family cow or the neighbor's cow for milk. With

certain families definitely encouraging results were achieved. Interesting in this connection is the statement of one of the nurses:

"Although I would like to see many families have cows, few of them do. Most families can neither afford to buy one, nor know how to care for one. Preaching the family cow is like butting one's head against a wall. Better results were achieved in teaching families how to use evaporated milk. Many mothers did not realize that this milk came from cows, and had no idea how to use it except to pour the undiluted milk in coffee. I feel that my major accomplishment in nutrition teaching has been in securing a greater use of evaporated milk."

#### FOOD SUPPLEMENTS

Distribution free or at cost of certain essential foods was undertaken. The public health association handled cod liver oil and considered powdered milk. The former was purchased by the drum, distributed in the clean, sterilized whiskey bottles so readily available. Later, capsules of shark liver oil were substituted for the cod liver oil which was then becoming expensive. The distribution of capsules was cleaner, proper storage was easier, and the capsules were more acceptable than the liquid cod liver oil.

Iron was distributed or prescribed to prenatal patients with anemia. The patients for whom it was prescribed usually purchased it at their own expense. A hemoglobin determination gradually became a routine procedure at most of the prenatal clinics. The data are too sketchy and the cases too few to permit conclusions about iron medication. However, in one clinic where recent records were reviewed, about 40 per cent of the patients on admission had a hemoglobin of 75 per cent or lower, as judged by the Tallquist scale. This usually improved under treatment. It seemed that patients with a low hemoglobin were more often prone to complications of labor than were other patients.

## EVALUATION

Objective evaluation of the work is difficult because of the short time that the program has been in operation. However, all but two of the 23 schools started a lunch program. It will be of value at a later date to make another dietary survey in the schools, and to compare the findings with those given here. Improved school attendance did seem to occur, particularly in the schools for colored children after a lunch program was inaugurated.

The public health nurses from their case records can list many families who have improved their diets as a result of the nutrition work of the nurses. It might be worth while, using the dietary survey technic, to determine any trends in diet of families, and especially of prenatal clinic patients, and by following certain patients through repeated pregnancies to determine whether the dietary habits of these women have improved appreciably as a result of the work done with them.

Subjective evaluation, lacking more objective data, is of interest and value. The following, from a county nurse, commands attention:

"I find that a mother who has been taught proper infant feeding takes at least part of this information over in feeding the next baby. This has not been true with my prenatal patients, however. There seems to be little if any carry over of better diet for the mother into her next pregnancy, but during any one pregnancy her diet usually improves as the result of working with her. Why there should be no carry over I do not know, except that financial means are limited, and a mother will feed her baby but do without for herself."

## SUMMARY

In summary, the basic essentials for nutrition work in any county are believed to be: (1) effective leadership, to be supplied by the nutritionist of the state health department, county home demonstration agent, teachers, etc., and (2) a sufficient number of effective pub-

lic health nurses to do the family case work, assist teachers in schools, and help with the promotional activities.

The program in one county has been described in which the school lunch program was featured. The problem was defined by means of a dietary survey. Lay helpers with the survey proved to be effective propagandists for the cause of school lunches. Equipment and money were provided by the school board, organizations, and individuals. Surplus commodities were used. WPA and NYA and volunteers provided labor. All but 2 out of 23 schools were stimulated and helped to start a lunch program in which free lunches were provided for the children from indigent families as a part of the program.

Demonstrations were conducted at prenatal clinics. A home economics class for underprivileged women did not succeed. Nutrition education for the individual and family, and particularly for the prenatal patient, was conducted by nurses. The dietary survey was the foundation for this work, in which types of food, budgeting, and the value of home gardens, canning, storage pits for staple vegetables, and the family cow were all emphasized. Cod liver oil and shark liver oil capsules were provided free or at cost to selected families; and an iron compound was given or prescribed for prenatal patients with anemia. In all of this work the coöperation of school authorities, welfare workers, the county home demonstration agent, and various lay organizations was available as needed.

The experiences recorded here make it clear that nutrition work represents a long-time educational project.

NOTE: I am especially indebted to Catherine Leamy, Maryland State Nutritionist, for guidance with the nutrition work in the county and to the late Mamie Thompson, Public Health Nurse, in Worcester County, for her unusual efforts in behalf of the project.

# Housing as a Health Officer's Opportunity\*

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LEADERSHIP in organizing community health services on a modern and adequate basis is what may be reasonably expected of any health officer. There is probably no one in the Health Officers Section who has not played his part as a leader in some of the well recognized activities of health departments, such as the prevention and control of diphtheria or tuberculosis or syphilis, or general civic sanitation, including privy or sewer construction.

Times like these bring repeatedly to the health officer challenges to exert himself in less-trodden fields, and among you there have been excellent pioneer workers in studying cancer and in organizing various approaches to the complicated problem of medical care and hospital service.

Some health officers feel that, while it is difficult to control what community services are assigned to the health department, there is obviously a risk in spreading the health department butter so thin over a multitude of administrative matters that the quality of the service rendered to the people will eventually become quite unsatisfactory, not only to the people but to the health department itself.

Until a few years ago the problem of improving the housing for the poorer segments of our urban population was

not widely accepted as a health officer's responsibility in this country. During recent years, however, health officers who have been a trifle bold in approaching this knotty matter have occasionally found to their surprise an unexpected warmth of community support. Indeed, one health officer I know who ventured rather timidly in this field as an experiment, and then waited for the heavens to fall, was quite astounded to find that the better element in the real estate group in his community was not openly disturbed, and a little later the community and the health officer himself were asking the same question; namely, "Why didn't the health department become active in this field long ago?"

I should like to show that there is a real opportunity for the health officer who will recognize housing as a legitimate preventive health service reasonably to be expected from the health department by relating some of the more interesting experiences that we have recently had in Baltimore.

Even a casual review of our general nuisance abatement ordinances and certain sections of the local building code made it clear that there was ample authority for the City Buildings Engineer or the Commissioner of Health to issue orders on property owners where dwellings were found to be beyond doubt unfit for human habitation and dangerous or detrimental to life or health. A first approach just happened to result from a request from the

\* Read before the Health Officers Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 16, 1941.

rather new City Housing Authority that a very dilapidated slum courtyard be removed because one of the new Housing Authority building projects was to have its front yard just across the street from this slum unit. The owner of the property was notified by the City Buildings Engineer on the recommendation of the Commissioner of Health that, unless the properties were made safe and secure within a ten day period, action would be taken by the Bureau of Buildings under ordinance provision. This resulted in the demolition of the properties in question without noticeable protest on the part of the owner.

Some months passed by and the City Health Department through its Sanitary Section developed rudimentary inspection services aimed to discover similar rock-bottom slum conditions where dwellings, inhabited chiefly by Negroes, were frankly unfit for human habitation. At this juncture, the Health Department secured superb support from the City Welfare Department and also from the local press. *The Baltimore Evening Sun* established as one of its major interests the education of the general public in the matter of these local slum dwellings. It became customary over a period of months for the Commissioner of Health to make personal surveys in company with the City Welfare Director and the so-called "Architectural Correspondent," a very socially-minded editorial writer. The last mentioned gentleman brought with him a press photographer who had not only a good instrument but a vivid imagination.

This group, appreciating that they could not take the public to visit the worst slums, were in a reverse manner enabled to take the slums week by week to the very doorstep of the general public, and place before them, in a series of editorial page illustrated articles, information that was responsible for a phenomenal amount of public

support for the program in question. The titles of some of these illustrated press releases were as follows:

Gems of Baltimore Architecture  
A Slum No More  
The Great Wall of Pine Street  
Early American Interior  
Landscaping in a Row House District  
There's Gold in Slum Housing  
The Bevan Street Housing Development  
The Peach Street Arc de Triomphe  
Rats and a Bathtub  
The Health Department's Authority To Go  
After Rotten Dwellings  
This House Had the Honor

The press articles in question appeared during an interval of about 18 months, beginning early in 1940. Some of them rather naturally were upsetting to the peaceful custom of allowing these worst slums to remain without attention. It soon became evident that there was a group of city officials who constituted a team with authority to take definite and suitable action in a variety of directions. It was also apparent that the team in question was very much like a group of football players who were placed on a field without uniform, without preliminary coaching or training and, under the gaze of an expectant grandstand, were called upon to produce with promptness a series of touchdowns; further, it became promptly apparent that no rules or signals had been established for their teamwork. From the early efforts it appeared as though one or another of the team at the signal secured the ball but ran in the wrong direction and made a touchdown for the opposite side.

What was necessary in the matter seemed fairly obviously to be some gentle and kindly group guidance, interspersed with much mutual toleration and patient persistence. There was thereafter little or no delay in bringing about very excellent teamwork in the group of official and nonofficial agencies that were involved in the problem.

Part way through the recent experience, a landlord refused positively to comply with the orders of the city authorities, that is, the Commissioner of Health and the City Buildings Engineer. The refusal eventually resulted in a legal battle which served as a test case. During this testing it was made clear that the ordinance provisions governing the matter were not adequate. Because of the great public interest that had resulted from the assistance from the press, it was not a difficult matter to secure the enactment of two highly desirable new ordinances. One has been given the title "Ordinance on the Hygiene of Housing." This added new sections to the city health code and authorized the Commissioner of Health to compel compliance with its provisions. The other, now known as the "Rooming House Ordinance," amended existing local legislation and greatly strengthened the authority of the city health department in preventing overcrowding of rooming houses in a manner that would be detrimental to health.

Even before the enactment of the new ordinances, the test case was won in the Criminal Court after nearly a year of legal maneuvering. The Health Department then found itself in a rather strong strategic position but without adequate personnel to make the many inspections that seemed to be needed. As an example of the conditions that had been found in rooming houses, mention may be made of one 15 room converted dwelling, housing 15 white families with a total population of 47 persons. Here 9 families shared 1 sink in the bathroom, 12 families shared 1 toilet, and 13 families shared 1 bath. The walls and toilet and steps were defective, not to mention rat infestation and accumulations of filth. Another sample was a 15 room multiple dwelling housing 5 white families. Here in 2 rooms lived a family consisting of the mother, father, and 6 children. In the

same house there were 33 occupants and of these 20 were children. There was only 1 bathroom. The tub was not available, as the connections had been removed, and there were in the whole house only one basin and one toilet. Findings of this kind when brought to public attention resulted in the addition to the City Health Department staff of two full-time inspectors to care for the great overload of work, and this made a total of 3 men devoting their entire time to housing.

It is obvious that there are many steps which lie ahead in reaching a satisfactory solution of this housing problem for the community under consideration, but a fairly good start has been made and just now it does not seem probable that there will be any decrease in Health Department interest in this important health field.

It will be of interest to health officers to know that the Committee on Housing of the Health Officers Section has been active during the past year, although not as active as had been hoped for a year ago. On May 7 last it sent a circular letter to all the members of the Health Officers Section for the purpose of telling them of the committee plans and to secure responses indicating which members of the Section were particularly interested in housing as a practical problem of health administration, as well as which members wished to keep in touch with the committee and its work. Replies were received from 40 members of the Section. Of these, 14 were in cities of 100,000 population or over, and 17 were in cities of less than 100,000 population. There were also replies from 3 state health officers, 5 health officers outside of the country, of which 3 were in Canada, and 1 district health officer from a large city.

The following brief extracts from a few of these letters will indicate their general tenor:



"My present problem is to secure legislation by which I can prevent overcrowding in lodging houses where single and double rooms are rented as apartments."

". . . housing problems in the rural sections are fairly new to me, but I would appreciate any information or publications you have on that subject . . ."

"It seems to me that this is a field in which there is a real opportunity for the Health Officers Section to be of service to its members."

"I am extremely interested in the activities of your Committee on Housing. Housing has long been No. 1 public health problem in this community and with the addition of 12,000 defense workers it has presented difficulties for which we have been unable to find a solution."

"We note with interest, the organization of a Section Committee on Housing in the Health Officers Section. . . . The preparation of the brief working bibliography, to which you refer, may well be of great assistance to any of us. . . . There are, in (this city) a large number of substandard houses now occupied and it has been practically impossible to declare them unfit for habitation and require

that they be vacated inasmuch as there are not adequate homes to which these occupants can be moved."

The replies were of great interest to the committee and it is hoped that during the coming year it may be more active and more helpful to the members of the Section.

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# Relationship of Mental Hygiene to a Local Health Department Program\*

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A MENTAL health program was inaugurated in Tennessee with the establishment of a Child Guidance Study, a psychiatric unit attached to the local health department of a rural county, in September, 1935. The immediate purpose of this project was a quantitative study of mental illness and maladjustment in a rural community, with the ultimate objective of devising and demonstrating methods for the inclusion of mental health procedures in the programs of existing public health agencies. The approach to the initial objectives and the results of the preliminary studies have been described in other papers from the study.<sup>1, 2</sup> The purpose of this paper is to present a progress report on a program designed to demonstrate the possibilities for the training of personnel and the application of therapeutic and preventive mental health measures through established public health agencies.

## THE SET-UP

Although our ultimate goal is to pro-

vide a state-wide mental health service, the first stages of the program have been confined to a single county. It is our opinion that the county is perhaps the best basic working unit through which the mental health program can be applied on a state-wide basis. The experience gained in the one county used as a proving ground should determine largely the procedures to be followed, in extending mental health services to other counties of the state.

Williamson County, Tenn., is a fairly typical agricultural county of approximately 25,000 population. It has had a local health department since 1921. For the past twelve years the health unit has had a staff which, according to present-day standards, is adequate to meet the usual public health requirements of a rural county. For the past six years the Child Guidance Study, though administratively a unit of the State Department of Public Health, has functioned as a branch of the county health department. The regular personnel of the study consists of 5 full-time workers (director, 3 nurses, and secretary) and a consultant. The director and consultant are psychiatrists. The nurses have had varying degrees of special training in the fields of psychology, psychiatry, and psychiatric social work.

\* Read before the Health Officers Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 14, 1941.

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## THE MENTAL HEALTH PROBLEM

The scope and extent of the problem of mental illness and maladjustment are gradually receiving due recognition. People are coming to an appreciation of the importance of mental health for physical well-being and the social and economic life of the nation. In appraising the problem of mental health we must take cognizance of groups other than those with frank mental disease. All personality deviations that render human beings less happy, less efficient, and less able to adjust themselves to established social amenities must be taken into account.

Current literature is studded with communications that exemplify the infiltration of psychiatry into all fields of medical work. Many authors, particularly Bassett,<sup>3</sup> have pointed out the broader community aspects of mental hygiene. Various surveys in this country and abroad have given some indication of the prevalence of mental and personality disorders. Among the most thoroughgoing and illuminating surveys are those of the Mental Hygiene Study of the Eastern Health District of Baltimore, Md. That survey was first described by Fairbank<sup>4</sup> in 1936, at the

annual meeting of this Association. Subsequent reports by Cohen and Fairbank<sup>5,6</sup> and Freeman and Cohen<sup>7</sup> showed that in the urban area of about 56,000 population studied, approximately 4½ per cent of the inhabitants had definite mental or personality disorders, while an additional 2½ per cent presented conduct and behavior disorders, the majority of which could be classified as mental health problems. Recently, Lemkau, Tietze, and Cooper<sup>8</sup> published a brief review of the Eastern Health District Mental Hygiene Study, in which some of the possibilities for therapy and prevention were outlined and the possible use of public health personnel in such work was suggested. While not all of their findings are applicable to the mental health situation in a rural community, their prevalence statistics are revealing and, interestingly enough, correspond rather closely to ours.

In Williamson County, the psychiatric survey made by our study<sup>2</sup> revealed that on September 1, 1938, there were at least 1,721 persons, or 69.4 persons per 1,000 population, whose condition merited psychiatric inquiry and consideration of treatment or pre-

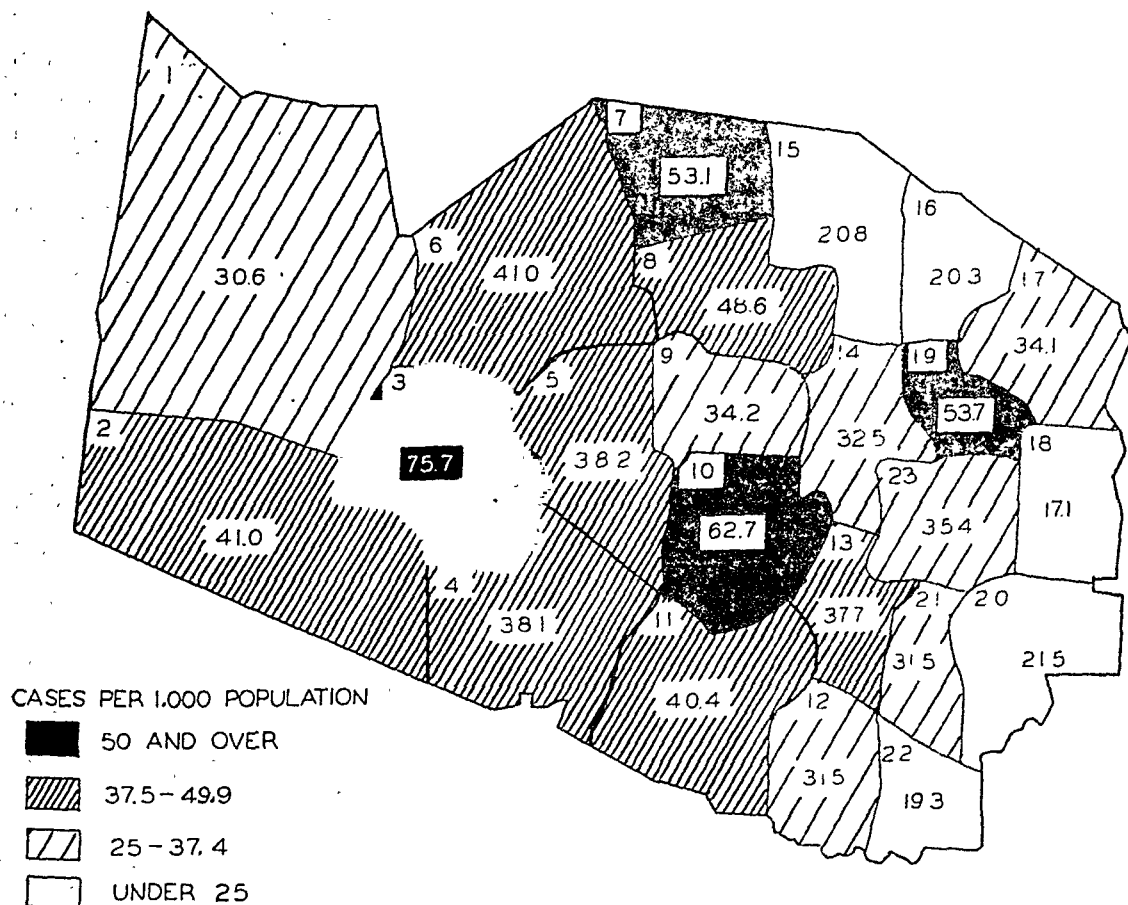
TABLE 1

*Psychiatric Classification of 1,721 Residents of Williamson County with Rates per 1,000 Population, as of September 1, 1938*

<i>Classification</i>	<i>Number of Cases</i>	<i>Rate per 1,000</i>
Total	1,721	69.4
"Active" Cases	914	36.8
Psychotic and post-psychotic	121	4.9
Psychoneurotic	89	3.6
With conduct or behavior disorder	285	11.5
With psychopathic traits	152	6.1
With special personality type	208	8.4
Mentally retarded *	19	0.8
With organic conditions, handicapped, miscellaneous	40	1.6
"Inactive" Cases	807	32.5
Post-psychotic	35	1.4
Formerly psychoneurotic	10	0.4
Formerly with conduct or behavior disorder	129	5.2
With psychopathic traits	34	1.4
With special personality type	126	5.1
Mentally retarded	184	7.4
With organic conditions, handicapped, miscellaneous	289	11.7

\* Includes all cases of mental retardation presenting active problems which are not included in the classifications higher on the list.

FIGURE 1—Distribution of active cases on September 1, 1938, Williamson County, Tenn. (Districts 3, 10, and 19 had intensive survey)



ventive measures. Of these cases, 53 per cent were classed as "active" mental health problems (see Table 1). The remaining 47 per cent, while classed as "inactive" were regarded as potential problem cases. The rate for active cases was 36.7 per 1,000 population; and if all cases of mental retardation had been included in the active group, this rate would have been increased to 44.5 per 1,000 population. Furthermore, it was judged that, in at least 604 of the cases (24.4 per 1,000 population), the mental disorder or personality maladjustment was of such magnitude that psychiatric treatment was urgently indicated. Moreover, there is much evidence that these prevalence figures were too low; in three representative areas of the county that were intentionally subjected to more

searching survey, the case rates were almost twice as high as the rates for the rest of the county (see Figure 1).

Every community has its quota of individuals with mental disorders and personality deviations. Every community agency, in one way or another, faces the problem of dealing with this group of people, and the public health organization should be particularly concerned with them. Among those with more serious mental disorders, the psychotic, pre-psychotic and post-psychotic present special problems of management in home and community. The psychoneurotics require a distinctive type of approach by those administering medical care. The epileptics need careful supervision of drug therapy and general hygiene. The feeble-minded must be managed quite differently from other

people. The spastics and all others, mentally or physically handicapped by organic defects, should be given the benefit of appropriate guidance and corrective measures, with constant observation of the principles of mental hygiene. Children presenting habit patterns of faulty nervous and emotional control and persistent behavior disorders should have special attention, that they may be saved, if possible, from becoming misfit adults. Last and largest, comes that great group of adults who cannot properly be classed in any of the above mentioned categories but who are emotionally warped or unstable and/or intellectually handicapped; these generally provide our most serious problems of conduct disorder as well as innumerable instances of uncoöperative, unreasonable, and antagonistic behavior.

In our opinion the people included in these classes have a disproportionately high representation in that oft-cited "one-third of the nation" that goes without adequate food, clothing, shelter, and medical care, and they undoubtedly make up the great bulk of that segment of our population. The fact that these people lack a fair share of the benefits of modern civilization is not so much an indictment of our way of life and our system of medical care as it is an indictment of our tendency to treat all men as equal *and therefore the same*. Mental disorders and personality deviations should be recognized and should be accorded appropriate management. Public health workers, to attain the maximum of success in their programs, must know when to adopt a policy of individualization of approach; they must recognize the personal variations in people and, in addition to employing specific procedures for mental health, they must adapt their standardized technics to meet individual situations.

Certain public health activities which are more or less universally established

provide splendid opportunities for constructive work along mental hygiene lines. In the health courses to classes of high school students—the premarital group—public health physicians and nurses are in a position of unequalled vantage for promoting mental health. While carrying out their routines of prenatal and postnatal care and conducting well baby and preschool clinics, they are in a most strategic position for recognizing and correcting conditions that are mentally unhygienic as well as those that are physically detrimental. The object of our mental health program is to devise ways and means of making the most of such opportunities.

#### THE DEMONSTRATION PROGRAM

Our plan for a mental health demonstration program to be tied in with the routine activities of a local health department includes four principal lines of procedure as follows:

1. A demonstration psychiatric and mental hygiene clinic, serving the county
2. A special program of training in psychiatry and mental hygiene for the regular public health personnel of the county, including:
  - a. A short didactic course in the fundamentals of psychiatry
  - b. Demonstration of problems at weekly staff conferences by use of clinic cases
  - c. Routine individual and group conferences of public health nurses with a case work supervisor
  - d. Joint visiting in the field by public health and psychiatric personnel
3. Psychiatric education of other professional groups
  - a. Practising physicians of the community
  - b. School teachers of the county
4. Community education through:
  - a. Talks to Parent-Teacher Associations and other lay groups
  - b. Newspaper articles

Part of this program has been put into effect during the past year. The separate phases of the program and accomplishments to date will be discussed

as each of the procedures is presented.

*Demonstration Clinic*—Our knowledge of case material, our contacts with local agencies and especially the well established working arrangement with the local health department and the practising physicians of the community, were used to provide a source of cases for this clinic. The clinic was organized and planned to conform to accepted standards for psychiatric and mental hygiene clinics, utilizing the specialized personnel of the study to provide essential clinical services. The Director and Consultant furnish clinical psychiatric services; one of the nurses with special training functions as clinical psychologist; and all of the nurses function as psychiatric social workers, with the one accredited by graduation from a school of psychiatric social work serving as case work supervisor.

It was arranged so that approximately the same amount of time should be given to clinic appointments as would be available if the clinic were part of a travelling unit spending one day per week in the county. This amount of clinic service represents the absolute

minimum required to carry on work of the desired quality. Incidentally this conforms to the policies and methods of the Bureau of Mental Hygiene of the Connecticut State Department of Health, which have been described by Cunningham.<sup>9, 10</sup> Actually, during the first year of our clinic's operation, there have not been enough acute or "active" cases referred to provide the maximum case load that could be handled by a clinic operating on a one day per week basis. Advantage was taken of the extra time available to carry on follow-up studies of as many of the post-psychotic individuals as could be obtained and brought to the clinic. The statistics on the first 12 months of the clinic's operation are given in Table 2.

In addition to the considerable number of inactive cases admitted to the clinic, other atypical features are noted in the large number of patients with convulsive disorders and the small number of children of school age. Both of these facts are logical consequences of the situation. As the clinic service becomes better known and well estab-

TABLE 2

*Classification of Cases Admitted to the Demonstration Clinic During the Period October, 1940–September, 1941, by Age*

Classification	Total Cases	Age in Years				
		0–4	5–14	15–24	25–49	50–99
Total cases	94	5	19	15	35	20
<i>"Active" Cases</i>						
Psychotic, pre-psychotic, post-psychotic	23	..	..	1	13	9
Psychoneurotic	15	..	..	2	7	6
Psychopathic personality with conduct disorder	4	..	..	1	3	..
Epileptic *	16	1	4	7	2	2
With personality and behavior problems of childhood	6	..	6	..	..	..
Mentally retarded †	5	1	3	1	..	..
With organic conditions, handicapped, miscellaneous ‡	15	3	6	2	3	1
<i>"Inactive" Cases</i>						
Post-psychotic	10	..	..	1	7	2

\* Includes all cases of idiopathic epilepsy (except for 2 classed as post-psychotic) and other cases (including 2 mentally retarded) in which convulsions were the outstanding complaint.

† Includes all mentally retarded individuals not classified in other categories; in most instances cases referred for diagnosis. Includes mongolism.

‡ Includes cases of tic and habit spasm and of cerebral palsy, with or without mental retardation and/or convulsions.

lished a greater variety of cases, and a larger number of cases presenting minor problems, will be referred. It has been easy to obtain the cases with convulsive disorders because in such cases we have an example of a condition to which little stigma attaches and in which the disorder is quite objective.

On the whole, the results obtained with the clinic have been gratifying. It provides the county with facilities for prevention and treatment which, in our opinion, are at least the equal of those afforded by established services functioning in rural areas elsewhere. Moreover, the community is learning to take advantage of the services offered.

*Personnel Training Program*—The need for more undergraduate training in psychiatry and mental hygiene for both medical and nursing students is generally recognized. In instituting any program of mental health work in the average community, one of the requisite first steps is to compensate for the deficiencies of personnel training which have existed in the past. Hence, our early effort to supply postgraduate training in some manner necessarily took precedence over practically all else. The program was begun with a didactic course in the fundamentals of psychiatry which was presented by members of the study personnel. In six evening sessions, supplemented by the reading of recommended material which had been provided, the physicians and nurses of the health unit were given a sound though brief introduction to the subject. Following this, clinical teaching was begun through the medium of the regular staff conferences. At these weekly conferences all members of the medical and nursing personnel of the county health department have attended regularly. They hear case histories presented, patients interviewed, and discussions of diagnosis and treatment by the psychiatric personnel. To date this type of instruction has been

well accepted and has apparently furnished a most stimulating and educational experience for the public health workers.

To supplement the teaching program described above and to give the nurses instruction in the technics of case work, an individualized approach to people, we have inaugurated a system of individual and group conferences, with the case work supervisor of the study serving as consultant. Once each week individual conferences are scheduled with each nurse of the local health department. These interviews enable the nurses to bring up for discussion cases which they encounter in their routine work and which seem to present mental health problems. The case work supervisor, through her suggestions and comments, attempts to stimulate more study of the cases presented and to guide the nurses to a better understanding of each individual situation. Suggestions as to management are given, and the progress with each case is followed from week to week. Every two weeks there is a group nursing conference for the discussion of special problem cases of interest and of educational value to all. The nurses are encouraged to do collateral reading, with particular attention being given to the selection of reading materials and interpretation of their contents. In addition to the scheduled conferences, the case work supervisor is available daily for informal discussions without special appointment.

The results of these conferences to date have been highly satisfactory. While they have brought out the need for more psychiatric education of public health officers and nurses in their undergraduate and postgraduate training, the interest shown has indicated that much can be accomplished by practical field work of this sort. The use of clinical material is a distinct advantage in the training program.

*Education of Other Professional Groups*—There has been little time to carry on a formal program under this heading. Physicians and teachers of the community are well acquainted with the project; there have been many contacts between them and members of the study and local health department personnel, and a good deal of coöperative and consultant work on special cases has been carried on. Considerable material of an educational nature has been presented during the past years, but without any attempt at a formal program of psychiatric education. From time to time papers have been read before the county medical society on various phases of the work of the study and on special topics in the field of psychiatry. Similarly talks on mental hygiene have been made before teacher groups. The present plan is to proceed with an organized program for the presentation of psychiatric material to both physicians and teachers. The possibility of a didactic clinical course for the local physicians is being considered. As soon as possible it is planned to establish a regular program in coöperation with the teachers. Such a program would probably include as its main feature periodic meetings or conferences with the teachers; it would be carried out along much the same lines as the program in a rural Massachusetts county, recently described by Abbott and Gardner.<sup>11</sup> It is our opinion that physicians and school teachers generally are interested in problems of mental health and that an educational program following conventional lines will succeed in almost any community, providing tact and good judgment are used and the general methods are adapted to the individual locality in question.

*Community Education*—Here again conventional lines would be followed. To date we have not been able to undertake any formal program. Talks

to Parent-Teacher Associations and similar organizations and regular newspaper articles of elementary content on mental health topics would be the chief media of approach. The fact that all members of the medical and nursing personnel of the local health department are already regarded as leaders and teachers is quite naturally an asset in any such program of educational work.

#### PLANS FOR THE FUTURE

It no longer seems necessary to belabor the point of the responsibility of public health agencies for participation in work for better mental health. Vogel<sup>12</sup> has recently treated this subject in a most convincing fashion and has outlined recommendations for state health departments. Our local program has been devised with the idea of eventually extending it over a wider area, first perhaps to a circuit of several counties that could be handled by a single travelling psychiatric unit, and eventually to all counties having full-time local health departments. While such a program will inevitably entail additional expenditures, it should be pointed out that the federal government, through the U. S. Public Health Service and the Children's Bureau, is assisting in the financing of mental health programs. There are funds already available from the agencies mentioned which may be used for purposes of a mental health program of the sort we have in mind.

There is no doubt that all interested community agencies should take a part in any program for mental health. However, it is our opinion that, in rural areas where there is not already an established specialized agency rendering psychiatric and child guidance services, the local health department is the logical agency through which this and other preventive programs should be undertaken because:



1. It is a fundamental principle that psychiatric work should be carried on under medical supervision.

2. The local health department, where situations comparable to that in Tennessee obtain, is an outstanding social agency and through its general services comes in contact with cases from birth to death.

3. The local health department's work is closely coördinated with that of the school system. Obviously, the school population provides one of the most fruitful fields for work toward mental health.

4. Through its close working relationship with practising physicians, the health department has opportunities for working with cases that might be denied other agencies.

5. The health department has the advantage of offering a generalized service. This makes it possible to incorporate a psychiatric and mental hygiene clinic with the other activities of the department, thus avoiding the stigma that sometimes attaches to a separate and distinct unit.

6. Through its extensive coverage of a county and its contacts with the majority of the families, the local health department can serve as a valuable adjunct to the state mental hospital system. In situations where that system lacks adequate social service facilities, the health department can compensate for the deficiency.

7. The health department is the ideal agency to provide local headquarters for a travelling clinic unit.

8. The local health department can render the suggested psychiatric and mental hygiene services more economically than can any other agency.

#### SUMMARY

1. The mental health problems confronting the community are enumerated.

2. A practical demonstration program of mental health activities, coördinated with and integrated into the activities of a local health department, is outlined.

3. An account is given of a field experiment in the provision of psychiatric and mental hygiene clinic facilities through a local health department.

4. A practical method of providing much needed postgraduate instruction in psychiatry and mental hygiene for public health medical and nursing personnel is described.

5. A plan is outlined for the extension—through the local health department—to other groups in the community, of a program of education for the promotion of better mental health.

6. The possible application, over large rural areas, of the procedures being demonstrated is discussed, and the advantages of mediating mental health services through the local health department are enumerated.

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# Thiamin Content of Milk in Relation to Vitamin B<sub>1</sub> Requirement of Infants\*

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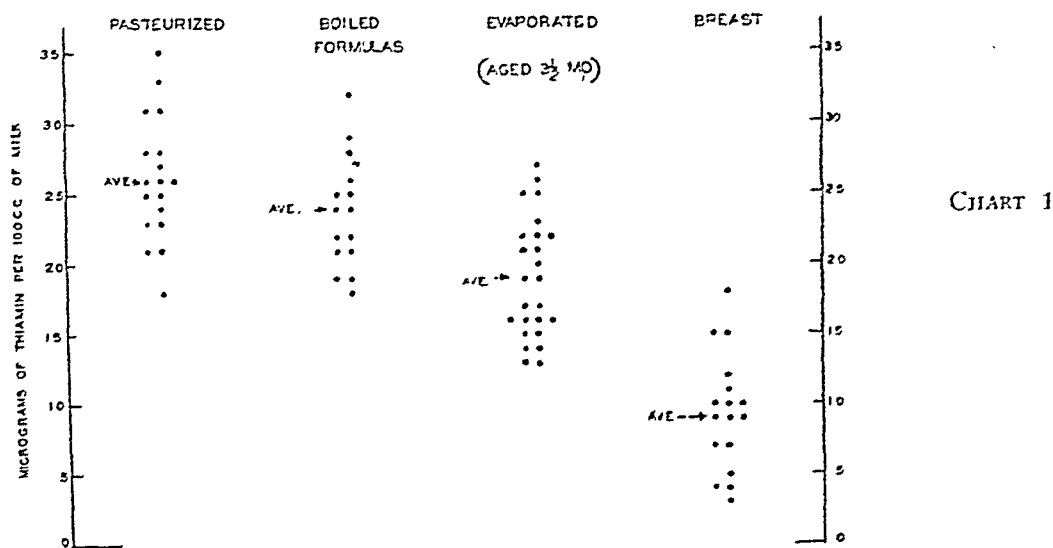
THE thiamin content of milk is important since it is the only natural source of vitamin B<sub>1</sub> available to the young infant. There are, however, complications which make thiamin assays on milk difficult. With biological assays, if the curative technic is used, it is difficult to get the depleted rats to consume the quantity of test dose that is necessary; if growth technics are employed, the basal diets must be completely adequate except in thiamin so that the resulting growth is due solely to the thiamin content of the test dose, but milk doses introduce the problem of added caloric ingestion which may affect growth. With thiochrome assays on milk the problem is also complex, since thiamin may be lost if proteins are precipitated, and the absorption and elution of the vitamin from the decalco column may not be quantitative. In our study we have employed all of these methods and are also investigating the application of the fermentation technic. The results reported here are based chiefly on growth assays, since thus far these have proved to be the most reliable.

Chart 1 compares results for pasteurized milk, boiled milk formulae, evaporated milk, and breast milk. The formulae were prepared from pasteurized milk which had been boiled for 3 minutes. The average thiamin content of these formulae was 24 micro-

grams per 100 ml. of milk, in contrast to the average of 26  $\mu$ g. obtained per 100 ml. of pasteurized milk. The boiling for 3 minutes thus had caused a loss of 8 per cent in the vitamin content. The range of thiamin for these pasteurized and boiled milks was from 18 to 35  $\mu$ g. per 100 ml. The evaporated milks tested had a slightly lower range from 13 to 27  $\mu$ g. of thiamin, with an average value of 19. The data for these evaporated milks have been calculated on the basis of reconstitution with equal parts of water to make comparisons easier between the different types of milk. The breast milks tested came from 17 different women. The thiamin content was surprisingly low, ranging only from 3 to 18  $\mu$ g. per 100 ml. of milk, with an average of 9  $\mu$ g. There may be several explanations for the low thiamin content of human milk. In the case of one woman whose milk was tested on four different occasions the milk consistently had high thiamin except during one week when she was ill and her milk contained only 20 per cent of its previous thiamin value. Diet is undoubtedly the most important factor in influencing the thiamin content of breast milk. To support this theory was the observation of a trend toward lower values for thiamin for some of the women who had but limited knowledge of fundamental principles in nutrition. Some preliminary studies have been done with supplementary thiamin for these women, but one week of increased intake has not been enough to

\* Read before the Food and Nutrition Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 14, 1941.

## VARIATIONS IN THE THIAMIN CONTENTS OF MILKS



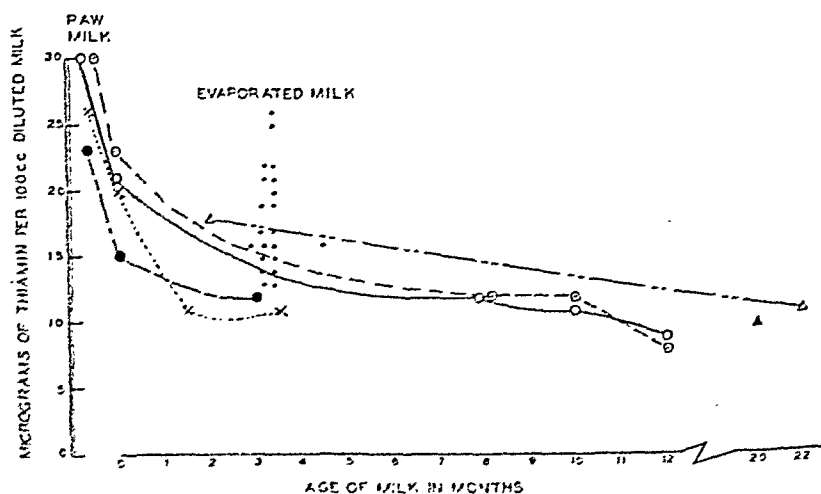
produce increased excretion of thiamin via the mammary glands. It is presumable that cow's milk is richer than human milk in thiamin because the cow can utilize thiamin which has been synthesized in her rumen.

Chart 2 shows in more detail the effect of processing on the thiamin content of evaporated milk. Raw milks and their corresponding evaporated milks were sent by special delivery direct from the factory to the laboratory and were assayed simultaneously. Destruction of vitamin due to the processing of

evaporated milk ranged from 23 to 35 per cent for the four lots of milk tested. Further loss of thiamin occurred during storage of these evaporated milks. The amount of destruction varied with different milks, but reached 50 per cent after 1 year for two milks, although another milk showed loss of one-half its original vitamin content in 2 months' time. This destruction upon storage is presumably more rapid during the first few months and eventually reaches an equilibrium. The rate varies for each lot of milk and is roughly indicated by

THE THIAMIN CONTENT OF MILK  
EFFECT OF EVAPORATION AND STORAGE

CHART 2



the lines connecting the separate assays on the chart. It must be noted, however, that the twenty-five commercial samples of milk representing seven different brands, in general had higher contents of thiamin than the four lots stored in our laboratory. The age of these commercial milks was approximately  $3\frac{1}{2}$  months, which is an average elapsed time between the manufacture and retailing of evaporated milk. The destruction of thiamin in evaporated milk is influenced by the degree and duration of heat during processing, the temperature during storage, and the pH

amount of thiamin excreted in the urine has been plotted against the level of intake for that metabolism period. At low levels of intake the infants excreted consistently low amounts of thiamin. At 80 units or more daily intake the thiamin appeared in the urine in larger quantities. Above 140 units of daily thiamin, the vitamin was excreted in still larger quantities, and it was apparent that more was being fed than the infant needed. From these data we might conclude that an intake of about 80 units of thiamin meets the infant's immediate needs and above this level of

VITAMIN B<sub>1</sub> METABOLISM STUDIES ON 12 INFANTS AGE 1-6 MONTHS

URINARY THIAMIN INCREASED, AT FIRST BY STEPS (—) THEN RAPIDLY, AS INTAKES WERE INCREASED

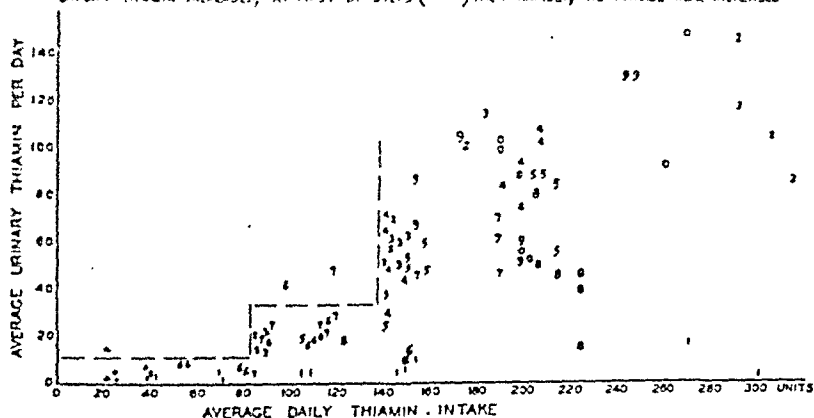


CHART 3

of the milk. That this destruction is a simple cleavage of the thiamin molecule into pyrimidine and thiazole was shown when one sample of old evaporated milk was assayed for pyrimidine as well as thiamin content and total values found which were identical with the vitamin B<sub>1</sub> content of the original raw milk.

In order to determine the significance of the thiamin content of these different types of milk, the metabolism of thiamin in the infant's body has been studied. Chart 3 summarizes the results of urinary excretion of thiamin when the infant has been given different levels of supplementary thiamin. Each dot on the chart represents data obtained during a 5 day period. In all, 12 healthy infants were studied for a total of 104 periods. The average daily

intake excess begins to appear in the urine. We do not know, however, whether or not 80 units represents the optimum thiamin requirement for the infant.

Another approach to the problem of requirement has been made by studying blood cocarboxylase levels. Since cocarboxylase is the functioning form of thiamin in the body cells, its estimation in blood cells should give an indication of the supply throughout the body. After several hundred determinations, during healthy as well as pathological conditions, we have concluded that about 5  $\mu$ g. of cocarboxylase per 100 ml. of blood is a normal value for health. Chart 4 shows the correlation between blood cocarboxylase, dietary thiamin, and symptoms in an adult.

# CORRELATION OF BLOOD COCARBOXYLASE WITH DIETARY THIAMIN AND SYMPTOMS IN AN ADULT

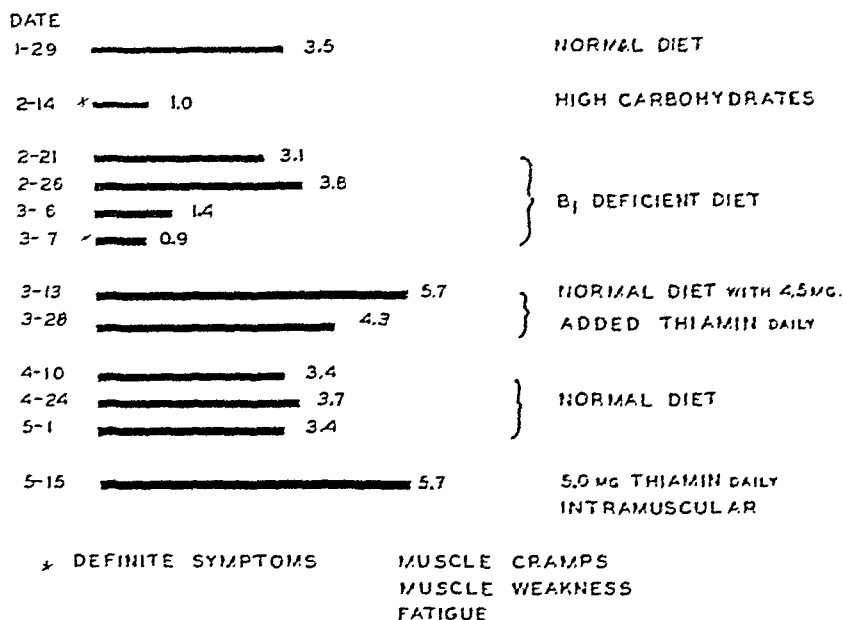


CHART 4

This person does not absorb thiamin well from the digestive tract, so that a normal diet gives subnormal blood levels. The 3.5  $\mu$ g. of cocarboxylase per 100 ml. of blood is not enough to protect against the sudden strain of illness, strenuous exercise, or excess carbohydrate diet. Symptoms of muscle cramps, muscle weakness, and fatigue were definite when the blood vitamin dropped to 1.0  $\mu$ g. A feeling of well-being was outstanding when blood levels had been raised above 5.0  $\mu$ g. by use of supplementary thiamin.

Chart 5 gives results for a few infants. In general, values tended to decrease from a level of 5 or more  $\mu$ g. shortly after birth to levels between 3 and 4  $\mu$ g. Lowest levels were found for infants receiving manually expressed breast milk. The data for two of these infants are given more in detail in Chart 6. The type of milk, amount of thiamin intake, and age of the infants are indicated across the bottom of the chart. On evaporated milk formulae the blood decreased from an initial level of more than 6  $\mu$ g. to 4.5 and 3.8  $\mu$ g. Breast

## INFLUENCE OF TYPE OF FEEDING ON BLOOD COCARBOXYLASE

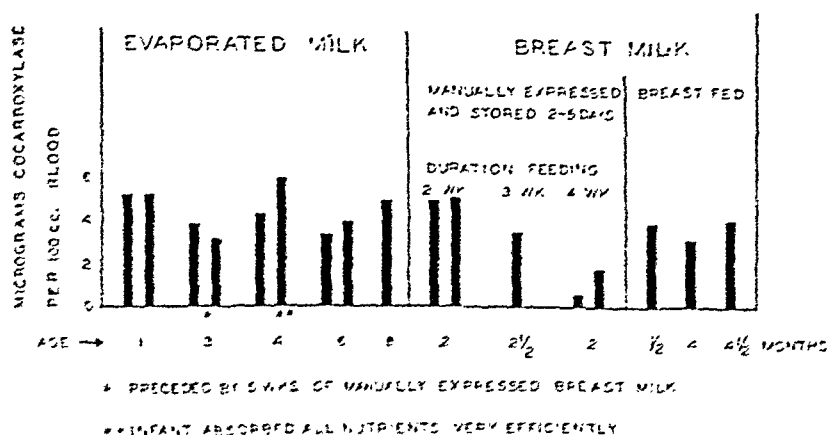
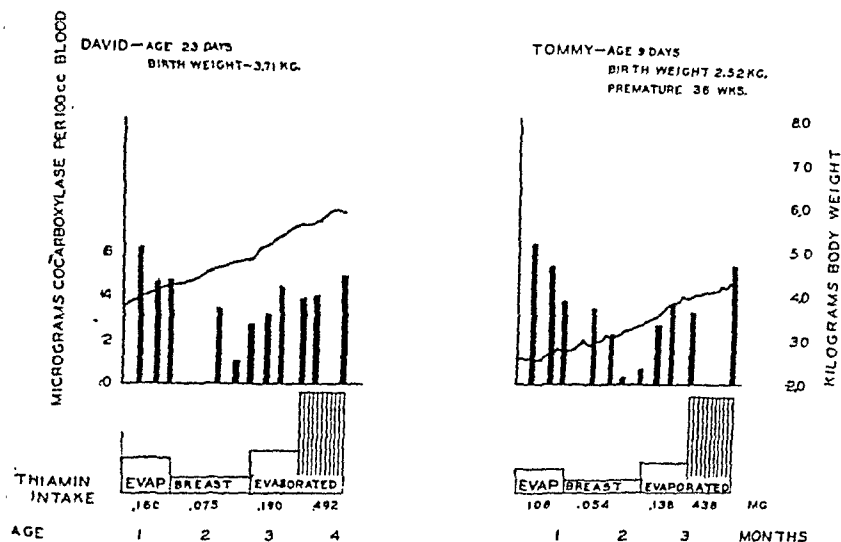


CHART 5

## BLOOD COCARBOXYLASE LEVELS IN ARTIFICIALLY FED INFANTS



milk feedings for the next 5 weeks brought the values down to 1.0 and 0.5  $\mu\text{g}$ . Subsequent feeding of evaporated milk slowly caused an increase in blood cocarboxylase to 4.4 and 3.6  $\mu\text{g}$ ., but the more optimum level of 5  $\mu\text{g}$ . was only reached after supplements of pure thiamin were included in the formulae. The infant whose blood responded best to his evaporated milk feedings received 190  $\mu\text{g}$ . or 63 units of thiamin daily in the milk. This level of intake is not far from the level of 80 units at which excess thiamin began to be excreted in the urine. It thus appears that, although intakes of approximately 200  $\mu\text{g}$ . in the present study could not maintain the 5  $\mu\text{g}$ . of cocarboxylase which we have come to consider optimum, the amount of vitamin B<sub>1</sub> furnished by milk formulae apparently did produce the fairly satisfactory level of 3–4  $\mu\text{g}$ . This level is adequate unless some unusual fever or metabolic strain increases the metabolic needs for thiamin. The milk thiamin for artificially fed infants can therefore presumably carry the burden of thiamin requirement for the young infant until cereals and other additional foods are included in his diet. It must be emphasized, however, that during times of

stress supplementary thiamin will be desirable as a safety factor.

An additional comment is necessary concerning infants receiving breast milk. According to our assays this type of milk cannot furnish 200  $\mu\text{g}$ . of thiamin daily. Nursing infants studied have usually had blood cocarboxylase levels between 3 and 4  $\mu\text{g}$ ., comparing well with those receiving milk formulae. On the other hand, those infants of our study receiving manually expressed breast milk showed lower levels of blood cocarboxylase. It may be possible that the thiamin content of the breast milk was reduced during the 2–4 days of storage before it could be fed. We know that cleavage of thiamin occurs more rapidly in more alkaline solutions. The average pH for our breast milk samples was 8.1, in contrast to values of 6.8 for pasteurized milk and 6.2 for evaporated milk.

Further studies on the thiamin content of breast milk and its adequacy for infant feeding are now in progress at the University of Chicago.

Additional data available as this paper goes to press show breast milk thiamin values to be higher than our earlier work indicated. Average thiamin content for women successfully nursing young infants was 20.1  $\mu\text{g}$ . per 100 ml.

# Present Status of Research in Cancer\*

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I SHALL attempt to discuss a complex subject in a very short time. Some of the statements will appear dogmatic, simply because it is impossible to present all of the supporting evidence.

In order to have a proper perspective, let us go back about 40 years to the beginning of experimental cancer research. At that time the best medical textbooks confined the discussion of cancer to a description of the gross pathology of tumors, to a rough classification of cancers according to tissues and cell types involved, to a crude outline of the growth and spread of cancer in the body, and to various speculations on the cause of cancer, such as Virchow's conception of cancer as a disease of cells caused by chronic irritation, or Cohnheim's hypothesis, according to which certain cells during embryonic development lose their physiological relations to other cells and later on for unknown reasons become malignant. Some physicians still held to the view that cancer is a disease of the blood, and others that it is due to a specific infectious microorganism. The possibilities of x-rays and radium in treatment had barely been recognized. There were no special laboratories and institutes for the experimental study of cancer. Statistical data on cancer mortality and incidence did not exist for the United States.

What is the present situation? From recent statistical studies of the U. S. Public Health Service, we know that the crude cancer mortality rate has been gradually increasing, a fact which is largely accounted for by the increase in the average longevity resulting from a better control of other diseases. We do know that the risk of cancer increases with age. The same is true of the mortality from spontaneous cancer in inbred strains of mice. Here, also, the mortality from cancer of the breast, lung, or liver increases rapidly in middle and old age.

Studies on human cancer incidence indicate that there are about 3 living cancer patients for each death from cancer. On this basis there are now in this country 450,000 persons with cancer. It is quite obvious that the importance of cancer as a major cause of death will continue to increase, unless better control measures are discovered by research.

What has cancer research accomplished until now?

Beginning in a small way, but gaining momentum, especially during the last decade, there have been discovered an enormous number of facts. The significance of some of these facts has become clear, as I shall show presently. To begin with, exhaustive research on cancer in mammals has conclusively demonstrated that cancer is not caused by a specific organism. In other words, cancer is not of an infectious nature, as, for instance, is tuberculosis. This

\* Read before the Health Officers Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., on October 15, 1941.

should finally allay all fear on the part of members of the patient's family of contracting the disease by contact with the patient. On the other hand, it is well established that cancer can be transmitted from one animal to another under special conditions, *i.e.*, by inoculation of living cancer cells from one mouse into another of the same hereditary constitution. However, these cancer cells fail to proliferate progressively in mice with a different heredity or in other species of animals, as, for instance, rats, guinea pigs, or rabbits. Furthermore, all attempts to produce cancer in animals by the inoculation of human cancerous tissue have failed. Moreover, we know that the susceptibility for spontaneous cancer in different inbred strains of mice differs for different types of cancer. Thus we have mouse strains with a high or low incidence of cancer of the breast, lung, or liver. We conclude, therefore, that cancer in man and other mammals is a disease of the cells of the body and that the disease is highly specific for each animal species and for each cell type.

What do we know about the conditions under which normal cells become cancer cells? There is irrefutable evidence that excessive exposure to x-rays, radium, or ultra-violet light can produce cancer. I recall to your attention the deaths from cancer of pioneer radiologists and of the girls who were engaged in the manufacture of luminous watch dials. From a practical viewpoint it is, therefore, important to protect the personnel in radiological clinics and x-ray operators in industry against excessive doses of x-rays or radioactive material. A recent survey of clinics by the National Cancer Institute has demonstrated the practicality of reducing exposure to x-rays and radium to 0.1 roentgen or less per day by proper construction and handling of apparatus. Similarly, we can prevent certain

"occupational cancers" which are caused by chemicals. For example,  $\beta$ -Naphthylamine is extensively used in the manufacture of aniline dyes. Experiments on dogs have shown that naphthylamine causes cancer of the urinary bladder, which is prevalent in dye factory workers.

To coal soot and coal tar were attributed cancer producing properties for 140 years, until in 1915 it was proved that long continued application of coal tar causes skin cancer in rabbits and mice. This important discovery made possible the prevention of skin cancer in workers handling coal tar on roads and in industry. Later, the active chemical in coal tar was isolated in pure form as 3,4-benzpyrene. This was followed by the recognition of the cancer producing properties of some 250 chemicals. One or two of these chemicals were formerly used for coloring butter and are known under the common name "butter yellow." Some of these chemicals have been of great value for the production and study in experimental animals of almost every kind of cancer known to occur in humans. This work has led to the following conclusions:

The injection of minute amounts of the powerful chemicals into the tissues of susceptible animals produces cancer, often within a few months. This is not necessarily accompanied by chronic irritation of the tissues. Once cancer has been produced, the presence of the chemical is no longer necessary for the continued growth of the cancer. In other words, the chemical is needed only for the transformation of normal into cancer cells. Most of the cancer producing chemicals are foreign to the animal body. However, it can be assumed with considerable justification that the naturally occurring cancers in human beings and animals may be caused by chemicals produced within the body. In fact, we know that large doses of female sex hormones can induce



cancer of the breast in animals. The discovery of other cancer producing constituents of the animal body is now one of the most important tasks of cancer research. Success may well lead to the effective prevention of certain types of cancer. Furthermore, animal experimentation, as well as clinical study, has firmly established the view that cancer is not a single disease but a group of diseases with some common characteristics.

Radium, x-rays, ultra-violet light, and chemicals all can produce cancer of the skin, yet these agents do not seem to have another property in common. If we knew how any of these agents cause the transformation of normal into malignant cells, we obviously should have a key to the causation of cancer. This problem is being studied.

In order to comprehend why cancer kills, we must try to explain why cancerous tissue grows progressively and why it invades and destroys normal tissues. A satisfactory explanation of this question may lead to more effective curative methods. Work at the National Cancer Institute has shown that these problems can be attacked successfully by the application of biochemical knowledge and methods. We have found that the growth rate of certain cancers in animals can be strikingly slowed up by maintaining the animals on diets partly deficient in essential components, such as certain amino acids or vitamins. The time may come when it will be possible to devise diets which will control the cancerous growth in patients.

Very important studies are under way to detect differences in the chemical composition and the activities of enzymes between cancerous tissues and the normal tissues from which the cancers are derived. Already striking

differences in the activities of certain enzymes have been discovered.

Quite recently we have found that a cancer of the liver transplanted under the skin will cause a profound reduction in the activity of the enzyme catalase in the supposedly normal liver of the animal. This proves that the growth of the cancer strikingly modifies the biochemistry of a tissue far removed from the cancer. In other words, the effects of the cancer are not confined to local effects, but evidently there are also definite manifestations involving the body as a whole. In these respects cancer research is entering rapidly into a stage similar to that which nutritional diseases occupied some 35 years ago, just before the discovery of the vitamins and enzymes which are so important for normal nutrition and for the prevention of nutritional diseases.

I shall be content if this paper has convinced you that cancer research has already accomplished a good deal and that further intensive work will be increasingly productive of new knowledge. Health officers are, of course, interested in practical applications. The whole history of medicine shows, however, that what at a given time has no practical use may be found useful later on. You also can contribute to cancer research by improving the reliability and usefulness of cancer death certificates. Such data are of great value for statistical studies.

In conclusion, let us never forget that cancer in time of peace or war is one of the most ruthless killers, accounting yearly for more than 150,000 deaths in our country. The misery caused to the patients and their families is enormous; so is the cost of medical care. I am confident that research will gradually solve the cancer problem.

# Education in Nutrition as Part of the Maternal Health Program\*

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THE main effort in any nutrition program is to bring about desirable changes in food buying, preparation, and consumption. All efforts in staff education and coöperation with other agencies are directed toward this one goal: to have the newer knowledge of nutrition reach down to every family in the community. But it is well known that marked sectional differences in food customs exist in the United States and that in some sections large groups of people adhere closely to a limited food pattern with a definitely local character. Thus the majority of the citizens of New Mexico have a fixed traditional dietary.

Before attempting to change such traditional food patterns the nutritionist will need considerable self-education. This is especially true if she has not previously lived in the state where the pattern prevails or has had no experience in a state with similar customs, needs, and problems. She must become acquainted as rapidly as possible with the different food patterns among her various groups. She must find out what contributions the traditional foods make to the total daily dietary. She must know how these food patterns measure up to the present-day nutrition standards. She must

know how the foods are traditionally prepared and determine whether or not these methods rob the foods of their nutritive value. She must learn something about the physical status of the people. From information available from records of maternity service clinics, well child medical conferences, school children's clinics, selective service examinations, surveys, etc., she should try to ascertain what are the outstanding nutritional needs. She should acquaint herself with family, community, and state resources in order to be practical in her suggestions for change or supplementation.

But this is not all the information she needs. She must acquaint herself with the attitude of the general public toward the food habits of the cultural groups living in their midst. She needs to consider the families themselves—their attitudes, prejudices, and superstitions. She needs to know what previous work has been done with the people. Only then is she prepared to work effectively.

## TEACHING THE MIDWIVES

New Mexico was first colonized by the Spaniards over 400 years ago. Their descendants are called Spanish-Americans as distinguished from the later settlers, who are called Anglo-Americans. This seems an unusual situation in the United States, but topography of the country and the prevailing poor roads have tended in the past to isolate

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† On leave from the State Department of Health, Santa Fe, N. M.

the Spanish peoples, who have therefore remained a distinct cultural group. Because of this and the consequent lack of medical facilities, most of our Spanish mothers were cared for by untrained midwives. For the past 4½ years the maternal and child health plan in New Mexico has included a training program for the midwives. When a nutritionist was added to the state staff, the midwife consultant asked her to conduct some nutrition demonstrations as part of this training program.

There are almost 800 midwives in New Mexico, most of them Spanish-Americans, speaking Spanish. The midwives are often leaders in their villages and they have been the ones who carried on the old traditions and customs, especially those concerning the care of mothers. In regard to food, some of their practices have been good—others not. For instance, for the first few days after delivery many of the midwives practically starve the mothers. Since the midwives are such influential people, we felt that if we could convince them of the importance of desirable food practices for the expectant and nursing mother, we could more easily effect other necessary changes.

Nutrition demonstrations for the midwives have been held in many New Mexico villages. The midwives are asked to bring their patients to the meetings whenever possible. The public health nurse also attends, and thus has an opportunity to observe a demonstration in the teaching of nutrition. The nurse asks questions and contributes to the discussion along with the midwives and expectant mothers. These demonstrations have proved an effective way for the nutritionist to work in the field and learn at firsthand some of the nutrition needs and problems of New Mexico. They have given her an opportunity to come into intimate con-

tact with the people of the state. They have also given an effective technic in staff education in that they show the public health nurse how to make practical application of nutrition knowledge. One nurse, discouraged because of the economic conditions existent in her district, said: "Frankly, before we had the nutrition classes for the midwives, I didn't think we could do anything in nutrition, even though we recognized it as one of our major problems." I have subsequently visited her district several times. The last time it was to work out a demonstration nutrition unit with the nurse and one of the teachers in a one room school. Incidentally, both nurses in this district make nutrition a regular part of their prenatal and postpartum home visits, as well as a part of their school health program.

#### ADAPTING THE PROGRAM TO THE TRADITIONAL FOOD HABITS

The response to this teaching program has been most encouraging. We have attempted to take the traditional food pattern of corn, beans, chili, and tortillas and point out to the mothers and midwives the good features of the diet. For instance, nothing pleases them more than to know that pinto beans are a good blood building food or that chili is an excellent food. In suggesting supplementation such as milk, cheese, etc., we have been able to point out to them that these foods are not new to the Spanish diet; that they used to be in the old Spanish diet when every family had a cow or goat and a garden. Some of the older midwives can remember when this was so.

We usually emphasize only one particular reason why these foods are necessary. For instance, we stress milk because it is the best bone and tooth building food we have. We point out that the pinto beans they eat every day give them some bone and tooth

building material, but that if the expectant or nursing mother were to get all of the bone and tooth building food she needs (that is, the equivalent of that in one quart of milk), she would have to eat from nine to eleven cups of cooked pinto beans every day. It is not unusual for many of our families to have pinto beans for breakfast, dinner, and supper. We do not discourage this, because we have economic obstacles in obtaining the desired amount of milk. However, the idea that they should eat nine cups of cooked beans every day to get the necessary amount of bone and tooth building material appeals to their sense of humor. Even the bean lover sees the impossibility of consuming that many beans every day.

In our attempt to get more milk into the diet we can often find a native dish which can be used for this purpose. Atole is a traditional Spanish dish and one of the first foods given to the mother after delivery. It is a thin cornmeal gruel made from the blue cornmeal. It used to be made with milk, but nowadays it is more often made with water. We are encouraging the mothers and midwives to use milk again.

Another one of our nutritional problems is that of helping our families with a year-round food supply of vitamin C. Clinic examinations show that during the late winter and early spring months we have vitamin C deficiency. We have plenty of vitamin C foods in New Mexico and these foods are well liked by our families. Chili is an excellent source of vitamin C when fresh. During the summer it is eaten fresh, but most of the year it is used as a dried powder for flavoring. Many of our families are learning through the Extension Service, Vocational Home Economics, and the Farm Security Administration to can their chili and thereby have it as a source of vitamin C throughout the winter.

Cabbage is another favorite vitamin C food, but here our problem lies in teaching the newer methods of cooking vegetables without taking away the traditional flavor. It is usually cooked in large amounts of water for a long time, much as our grandmothers used to cook it. The cooking water is thrown away and then the cabbage is fried with onions and chili. It is questionable whether cabbage cooked in such a way has much food value by the time it is served. We are gradually teaching our families to cook the new way and to use the vegetable water. We suggest and demonstrate to them frying the onions and chili separately and then adding them to the cooked cabbage or other greens the same way we add butter to our vegetables.

#### THE NEED FOR DEMONSTRATION

Just to tell families these things is not the most effective way to teach nutrition. We need to show them. We need to develop visual materials which will emphasize teaching points. For instance, an x-ray picture showing the formation of the tooth in the infant's jaw does more to get the idea over that such growth takes place before birth than all the talking in the world. In giving explanations, vocabulary is very important. It is doubly important when the members of the class speak a different language from the teacher. All explanations should be in as non-technical language as possible.

#### SCOPE OF NUTRITION WORK IN NEW MEXICO

This year with two field nutritionists on the staff we hope to develop some nutrition classes for fathers. Many of our public health nurses have found that it is the father of the family, especially among the Spanish-Americans, who makes the decisions, holds the purse strings, and does most of the buying. It is essential in any family

teaching program to take the fathers into consideration. It is also necessary to work with that member of the family who really makes the decisions.

The nutritionist cannot give too much credit to the work of the public health nurses and doctors. They have preceded her in the field of public health by a good many years. By constantly rendering needed services to families and communities they have won acceptance for the whole public health program. This is probably the greatest single factor which helps the nutritionist in her public health efforts.

Nutritionists on the state staff can function most effectively by serving in an advisory or consultant capacity. The direct service given should have staff education as its main purpose. Where the family is concerned, the nurses of necessity have to do most of the nutrition teaching and only in so far as the specialist in nutrition is able to help the nurse apply the vast knowledge of nutrition in solving the nu-

tritional problems she meets daily in the field, can an effective nutrition education program in public health be built.

#### SUMMARY

Nutrition education is an important phase of the maternal and child health program. Its main objective is to improve the nutrition of every family and individual in the community. Since the number of nutritionists working in local health units is limited at this time, the responsibility of teaching nutrition to families falls upon the nurse. The nutrition consultant on the state staff then has the responsibility of helping each nurse in the state solve her local nutrition problems in a practical way. In New Mexico we feel that our nutrition work with the midwives has been an effective way of demonstrating nutrition teaching to the nurses. In this work particular attention was paid to the traditional food habits of the families served.

# Stabilization of Chlorine in Water\*

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IT is accepted practice to disinfect water with chlorine, using liquid chlorine, sodium hypochlorite, or calcium hypochlorite. It is generally believed that these various forms of chlorine give exactly the same results, the choice being a matter of convenience in application. The writers have been unable to find any information in the literature to the contrary.

The following case reports are presentations of observed sequences in the treatment of swimming pool waters with various forms of chlorine, or the application of the same form of chlorine to various types of water as it pertains to the hardness, alkalinity, and pH of the water.

Prior to the fall of 1931, the Michigan State College pool was supplied with a well water of 500 p.p.m. hardness and a pH of approximately 7.6. Disinfection was effected with liquid chlorine. Chlorine residuals of 0.3 to 0.5 p.p.m. were maintained. The pH of the pool water was approximately 7.6. The sanitary condition of the pool was excellent at all times. In the fall of 1931 the pool was supplied with Zeolite-softened water. After several weeks of operation the pH dropped to 5.5, chlorine residuals were zero, and the

pool water was badly contaminated. The pool was emptied and refilled with hard water. The pool operated satisfactorily, as it had previously with hard water. The hard water was continued and the problem was dismissed without further thought, and no further difficulty arose.

In the summer of 1940, when the Moore's Park outdoor pool in Lansing was opened for use, a lime-soda treated water was used and a similar experience resulted. This pool has a capacity of 225,000 gallons. The water is recirculated through pressure filters every 8 hours. Formerly a well water of 500 p.p.m. hardness was used. The pool was operated at a pH of 7.2 to 7.4, with a chlorine residual of 0.3 to 0.5 p.p.m. During the summer of 1939 6 to 8 lb. of liquid chlorine were used daily. Maximum bathing loads of 225 were maintained, with a daily load of 800 to 1,000 bathers. Only occasional slight difficulty was experienced in maintaining chlorine residuals of 0.3 to 0.5 p.p.m. with bright sunlight. In 1940 the city and pool were supplied with a lime-soda treated water with a hardness of 85 p.p.m. and a pH of 7.6 to 8.6. The pool was operated exactly as before except for the use of softened water. With bright sunlight the pH fell from 8.0 to a range of 5.5 to 3.5. All bacteriological samples showed a high total count and high colon indices. To

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\* Read at a Joint Session of the Laboratory and Engineering Sections of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 15, 1942.

correct the pH, from 150 to 200 lb. of soda ash were added during the course of 2 weeks. During this period the pH would reach 7.1 at night but during the day it would fall to 5.5 despite the added alkali. It was impossible to maintain a chlorine residual in the sunlight. A heavy sludge formed on the bottom of the pool, apparently owing to the excessive use of soda ash. Following this experience, calcium hypochlorite was hand-fed into the pool for a period of 3 days. Chlorine residuals were maintained at 0.3 p.p.m. at the deep end of the pool during sunlight without difficulty. When the pool was again supplied with liquid chlorine it again became unsatisfactory.

Other soft water pools in the state were studied.

The outdoor pool at Midland is hexagonal in shape, with the inlet at the center at a depth of 10 ft. The flow is upward and outward to the edges, where the water flows continuously over a weir and through orifices. The pool has a capacity of 450,000 gal., with a 6 hour turnover and a 12 hour filter rate. The water is river water softened by a lime soda process. The softened water has a hardness of 80 to 85 p.p.m. and a pH of 8.6. At the opening of the 1940 season the chlorine fed was 15 to 20 lb. per day. The chlorine residual in the return line to the pool was 2 p.p.m., and 1 p.p.m. at the center at the surface of the pool directly above the inlet. The residual at the edge of the pool was 0. The pH was below 7.0. One to two inches of dead, burned magnesium oxide was placed on the filter as an experiment to increase and stabilize the pH. The pH increased from 0.2 to 0.4 but this increase was not sufficient to stabilize the chlorine or to raise the pH to the desired range.

Adjacent to this pool is a wading pool. This pool receives water from the larger pool. The overflow from the

wading pool is discharged to the sewers. Calcium hypochlorite is fed by hand in sufficient amounts to maintain 0.5 p.p.m. in the pool. No difficulties were experienced with this pool.

After observing the results of the hypochlorite in the wading pool and in the Moore's Park pool, 50 lb. of lime were placed in the mixing chamber of the large Midland pool. The pH increased to 8.0 or above and remained about 7.6 for several weeks without further addition of lime. The chlorine consumption was reduced by half and residuals of 0.2 to 0.5 p.p.m. were maintained at the edge of the pool in sunlight.

Following this experience, the Moore's Park pool at Lansing was treated with 15 to 20 lb. of lime during the course of 2 days. The pH was raised from 5.0 to 7.6. The chlorine consumption dropped from a maximum of 12 lb. to 6 lb. per day and chlorine residuals of 0.3 to 0.5 p.p.m. were maintained throughout the day. Bacteriological samples were satisfactory.

An indoor pool at the Roosevelt High School at Ypsilanti was next examined. This pool has a capacity of 60,000 gal. and is treated with liquid chlorine. The city water formerly had a hardness of approximately 350 p.p.m. and a pH of 7.6. The water is supplied from wells. When the pool was operated with hard water there was no difficulty in maintaining chlorine residuals or in maintaining the pH between 7.2 and 7.6. A small amount of soda ash was used occasionally for pH control following alum applications. About a year ago a softening plant was placed in operation. The softened water has a pH of approximately 8.6 and a hardness of 85 p.p.m. After using the softened water in the pool for a short period of time, the pH dropped below 7.0. At least 1 to 2 lb. of soda ash were required each day to maintain the pH in the alkaline range, generally at

pH 7. It was observed that the chlorine consumption increased materially and that it was virtually impossible to maintain chlorine residuals overnight without continuous operation of the chlorinator. Lime was substituted for soda ash for pH control. Approximately  $\frac{1}{2}$  to 1 lb. a week was added to maintain a pH range of 7.2 to 7.6. A considerable reduction in chlorine consumption has occurred since the introduction of lime treatment.

Four indoor high school pools in Lansing were studied. These four pools had capacities of approximately 75,000 gal., with a filter rate of 8 hours. Bathing loads ranged from a minimum of 25 to a maximum of 40, the daily bathing load being 8 classes. Previous to the installation of electrolytic chlorinators, these pools were supplied with hard water of approximately 500 p.p.m. hardness from wells. Liquid chlorine was used for disinfectant. Chlorine consumption in all these pools averaged less than 1 lb. per day. No difficulty was experienced in maintaining a pH range of 7.2 to 7.6. No difficulty was experienced in maintaining chlorine residuals throughout the 24 hours of the day. Bacteriological samples were satisfactory.

In January, 1941, these pools were filled with a lime-soda treated water with a hardness of approximately 85 p.p.m. and a pH of 7.6 to 8.6. The pools were equipped at this time with electrolytic chlorinators, so the pools were being treated with sodium hypochlorite. During the first few weeks of operation, with relatively light bathing loads, it was impossible to maintain a satisfactory chlorine residual in any of these pools. The amount of chlorine used in each case per day varied from 2 to 3 lb. It was observed that, although sodium hydroxide produced by electrolytic chlorinators was being continually fed into these pools, the pH dropped from the initial pH of 7.8 to

7.2 which remained constant. A rise in pH would be expected, inasmuch as little or no alum was being used.

During this period of use, the pool water had a greenish-blue hue, sparkled, and bubbled. In the morning, after continuous chlorination throughout the night, tiny gas bubbles were breaking over the surface of the pool, particularly near the inlets. Prior to the entrance of the swimming classes the pool water was crystal clear, with the bottom plainly visible at the deep end. In a few minutes after the bathers entered the water, the water became very milky in appearance and it was impossible to see the tile or the joints of the tile in the shallow end of the pool at a depth of 3 ft. The agitation of the water by the bathers provided additional aeration and broke up the large gas bubbles into finer bubbles and produced a marked turbidity. When the bathers left the pool and the water was undisturbed, clarity was restored in a very few minutes.

Following these observations it was decided to apply lime treatment. Calcium hydroxide solution was applied at a slow rate to the recirculating system on the suction side of the pump, ahead of the filters and chlorinators. The average time of application was approximately  $\frac{1}{2}$  hour per 1 lb of lime. After three applications of 1 lb. each, the pH of the pool water increased from 7.1 to 7.6 or slightly above. During the past several months of operation it has been necessary to apply from  $\frac{1}{2}$  to 1 lb. of lime per week to maintain a pH of 7.6. Immediately following the initial introduction of the lime with the stabilization of the pH at 7.6, it was observed that the chlorine consumption per day was reduced by one-half.

The use of lime treatment has made it possible in these pools to maintain chlorine residuals at 0.3 to 0.6 p.p.m. and even higher without difficulty. It has been possible to hold residuals of



0.2 to 0.3 p.p.m. throughout the night without operating the chlorinators during this period, which had been impossible before lime treatment was used. The gas bubbles on the pool surface and the milky appearance during use disappeared when lime treatment was used. The color of the pool changed from a greenish hue to a distinct blue.

An outdoor pool, the Richmond Park pool at Grand Rapids, using softened water, was examined. This pool has a capacity of 1,000,000 gal. and a filter rate of 8 hours. Liquid chlorine is used for disinfection. The water is a softened river water with a hardness of 100 p.p.m. and a pH range of 9.0 to 10.0. The chlorine consumption in the pool averages between 15 and 20 lb. per day. This amount would be considered normal consumption for this size pool. No difficulty is experienced in maintaining chlorine residuals in bright sunlight. The stability of the chlorine in this pool as contrasted to the other pools cited in this paper is probably due to two factors—(1) the high pH, and (2) the relatively higher calcium and magnesium carbonate content of the soft water.

#### SUMMARY

This recital of case reports on swim-

ming pool chlorination shows that in Zeolite- or lime-soda-softened water the use of liquid chlorine or sodium hypochlorite is unsatisfactory, particularly in outdoor pools, unless chlorination is supplemented by lime treatment.

These data show that the addition of soda ash to adjust pH is unsatisfactory in chlorinated-softened water swimming pools.

These case reports indicate the apparent instability of chlorine in the form of liquid chlorine or sodium hypochlorite when introduced into a recirculation system where chlorination of the same water occurs and the depletion of the base is not controlled. A similar condition would likely occur in the chlorination of the water supply or a sewage effluent if the dosage of chlorine was in excess of the base necessary for the formation of hypochlorite and the maintenance of proper alkalinity for stabilization.

These case reports indicate a greater stability of calcium hypochlorite as compared with sodium hypochlorite.

A later paper will present the data obtained from additional observations and from laboratory studies on the stability of sodium and calcium hypochlorites and their relation to the chlorination of water supplies.

# Decomposition of Land-fills\*

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IN the past, there have been presented before the Engineering Section of the American Public Health Association papers describing the procedure of placing land-fills as practised by the New York City Department of Sanitation. In 1939, a report of the preliminary survey work on land-fills was presented by Carpenter and Setter.<sup>1</sup> It is the purpose of this paper to present more results of research on land-fill characteristics as carried out by the Work Projects Administration under the sponsorship of the Department of Sanitation and the technical supervision of the staff of the Sanitary Engineering Research Laboratory of New York University.

The investigations were made at the five locations described as follows:

1. *Baychester*—A marsh area of about 150 acres bounded by Baychester Avenue and Bartow Street and adjacent to Eastchester Creek in Bronx County. Fill operations were started about 1927 and approximately 80 acres have been reclaimed and are available for recreation centers, park areas, or public building sites.

2. *Canarsie*—A tract of about 25 acres lying at the southerly terminus of Remsen Avenue, Kings County, near Jamaica Bay. Field operations were started in November, 1935, and some 25 acres have been reclaimed.

3. *Fairfield*—An area of about 2,000

acres located at the southerly terminus of Pennsylvania Avenue, and adjacent to the southerly side of Fairfield and Flatlands Avenues in Kings County. This is near the head of a basin leading into Jamaica Bay. Filling operations were started in 1933 and approximately 100 acres have been reclaimed.

At the southerly end of the Fairfield land-fill a bridge approach has been constructed using land-fill material. This bridge is part of a grade crossing elimination at the junction of Pennsylvania Avenue and the new Belt Parkway.

4. *Floyd Bennett*—This tract of approximately 1,500 acres is situated north of the Floyd Bennett Airport and adjacent to and east of Flatbush Avenue. It lies near a basin leading into Jamaica Bay. Fill operations were started toward the end of 1936. The area reclaimed (approximately 350 acres) will be available for the extension of the airport.

5. *Riker's Island*—This is situated in Long Island Sound, midway between Hunts Point in the Bronx and North Beach in Queens. In 1900 the area of this island was approximately 30 acres; today it is approximately 425 acres. The Riker's Island penitentiary has been constructed on this site, and it may be used for other public buildings. Land-fill material which had been in place here for many years was used as fill for the field and runways at La Guardia Airport. After being trucked across a temporary wooden trestle to

\* Read before the Engineering Section of the American Public Health Association at the Seventieth Annual Meeting in Atlantic City, N. J., October 17, 1941.

the site of the airport, the consolidated land-fill material was compacted by trucks, bulldozed and rolled ready for paving.

In order to determine the composition of fresh land-fill material the contents of 168 refuse collection trucks were sorted, classified, weighed, and measured. The data were obtained from the examination of material emanating from 19 out of the 41 sanitation districts contributing to the land-fills in the Bronx, Brooklyn, and Queens.

The load of fresh fill material selected for analysis was dumped from the truck on a clear level area of the fill at one side of the normal dumping operations. The sorting crew would then segregate the baked goods, vegetables, citrus fruits, greens, meats, bones, fats, fish, paper, metal, wood, ashes, glass, leather, rags, grass and leaves, rubber, and the remaining miscellaneous items.

The different groups were then weighed on a platform scale and the data entered on the sorting and classifying form. These materials were then dumped to one side and pushed into the fill by a bulldozer. For purposes of tabulation and comparison the sorted

components will be considered in the following categories:

- A. Organic
  - 1. Food Refuse
  - 2. Paper
  - 3. Wood
  - 4. Miscellaneous, including rubber, rags, grass and leaves, leather, and other less prominent miscellaneous items.
- B. Inorganic
  - 1. Glass
  - 2. Metal
  - 3. Ashes

It is obvious that these components do not occur in the same ratios throughout the year. The greatest variation occurs in the ash component, since hard coal is the major fuel used for heating homes and buildings in New York City. Therefore, the analyses were made each month and are summarized in Table 1.

It will be noted that the principal variations occur in the percentage of food refuse and ashes. These results should not be confused with the total tonnage of refuse received at the fills each month. They signify only that of all the refuse, with total tonnage varying each month, the percentage of each of the segregated items follows the variation shown in Figure 1.

FIGURE 1  
MONTHLY AVERAGE PERCENTAGE DISTRIBUTION BY WEIGHT  
OF FRESH FILL MATERIAL  
SEGREGATED AMONG FOOD REFUSE, MISCL., PAPER, WOOD, GLASS, METAL, ASHES  
BASED ON 168 TRUCK SAMPLES

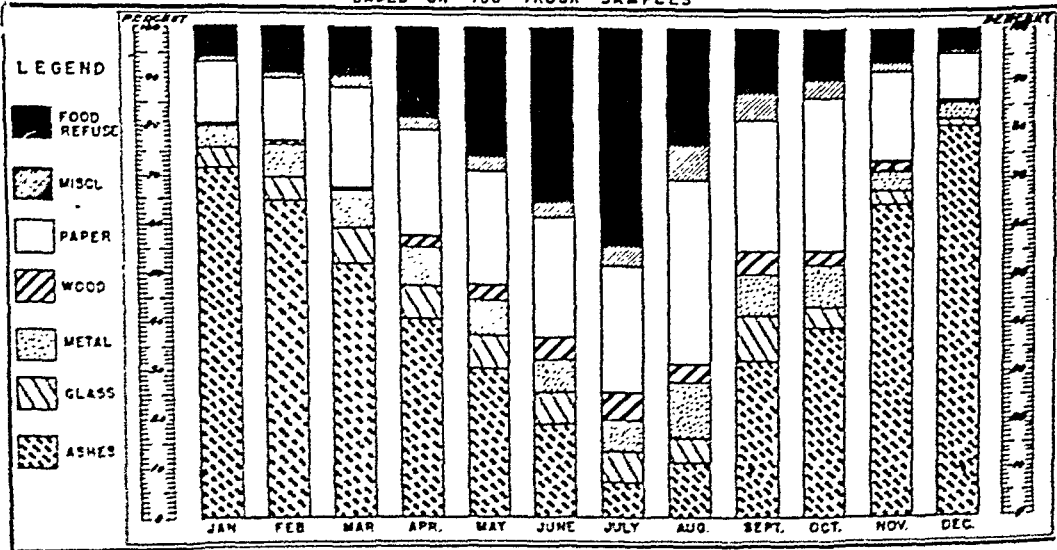


TABLE 1

*Monthly Distribution by Weight of Fill Material  
Based on the Sorting and Classifying of 168 Truck-loads of Fresh Fill Material*

Month	Organic				Inorganic			Total	Total Organic	Total Inorganic
	Food Refuse	Misc.	Paper	Wood	Metal	Glass	Ashes			
	%	%	%	%	%	%	%	%	%	%
January	5.7	1.0	12.4	0.3	4.3	4.0	72.3	100.0	19.4	80.6
February	9.0	1.7	12.6	0.7	6.6	4.9	64.5	100.0	24.0	76.0
March	9.7	2.1	20.6	0.3	7.4	7.3	52.6	100.0	32.7	67.3
April *	18.1	2.8	21.6	2.0	7.4	6.9	41.2	100.0	44.5	55.5
May *	26.7	3.3	23.0	3.1	7.1	6.8	30.0	100.0	56.1	43.9
June *	35.1	3.8	24.3	4.6	6.4	6.8	19.0	100.0	67.8	32.2
July	43.8	4.1	25.5	5.9	6.6	6.3	7.8	100.0	79.3	20.7
August	23.1	7.4	37.6	3.8	11.6	5.1	11.4	100.0	71.9	28.1
September	12.6	5.6	26.7	4.9	8.2	9.1	32.9	100.0	49.8	50.2
October	10.1	3.8	31.0	2.6	8.9	4.0	39.6	100.0	47.5	52.5
November	6.6	1.9	18.0	2.1	3.8	2.9	64.7	100.0	28.6	71.4
December	3.5	0.8	9.0	0.8	3.1	1.9	80.9	100.0	14.1	85.9

\* No samples taken in April, May, or June; obtained by graphical projection.

The material actually entering the fill does not include all of the components noted above. Contractors purchase scavenging permits from the city for the privilege of reclaiming such items as stoves, hot water tanks, large tin cans, and other metalware of value, rags, paper, tires, and any other material which can be sold to dealers. The amount of recovered material depends on the market value of the recovered waste and other factors in the economic cycle. Therefore, adjustments in the percentages entering the fills must be made to account for scavenging operations.

Having analyzed the fresh fill mate-

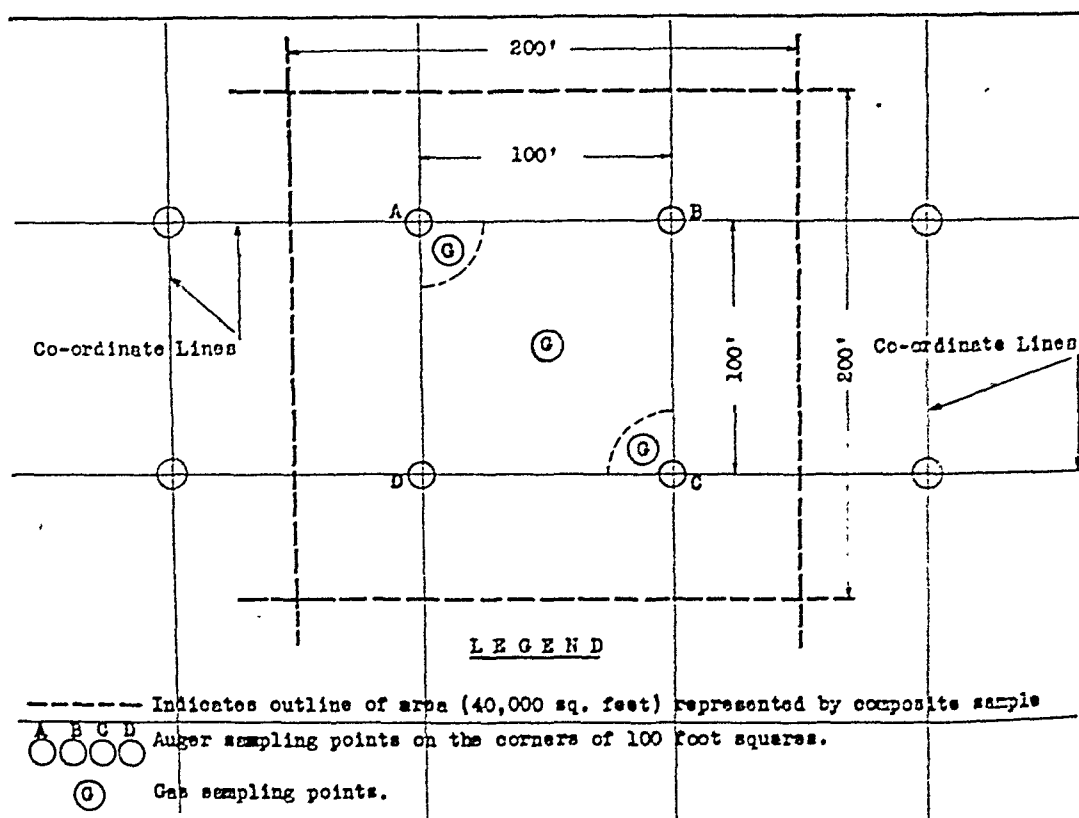
rial, it was desirable to take samples of land-fill after it had been in place for different periods of time. Sampling was accomplished by means of auger type post hole diggers which could be operated to a depth of 25 feet. Four auger holes were dug at the corners of a 100 foot square located in the center of the area to be sampled as shown in Figure 2. Three samples representing the top, middle and bottom of each hole were obtained. After quartering and collection of composite sample, the material was dried, manually separated and screened into the following classifications: material retained on 4 mesh screen, material pass-

TABLE 2

*Percentage of Oxidizable Material in Residue III*

Age (Months)	Top (2' to 4') Per cent	Middle (5' to 7') Per cent	Bottom (8' to 10') Per cent
0-3	2.8	3.6	4.6
3-6	2.9	3.5	3.7
6-9	3.0	4.1	4.5
9-12	3.0	3.1	4.3
12-18	3.0	3.1	3.6
18-24	2.6	3.7	4.5
24-30	2.2	1.9	2.4
30-36	2.6	3.2	3.4
36-48	2.2	2.7	3.3
48-120	2.8	4.4	3.8
360-420	4.1	3.2	2.6

FIGURE 2  
SAMPLING LAYOUT & PROCEDURES



### Sampling Procedures

#### A—Fill Material

1. Material sampled at each level from each of the sampling points, A, B, C & D is brought together on a clean tarpaulin.
2. It is then thoroughly mixed (composited).
3. The sample is reduced by quartering to one gallon.
4. The sample is placed in a one gallon friction top can, and submitted to the laboratory for analysis..
5. Report of field sampling data is made and forwarded to the laboratory with each sample.

#### B—Gas Sampling

1. At point of sampling (G) a gas sampler is driven to the sampling depth.
2. A sample of gas is taken from the fill.
3. The sample of gas is analyzed and data are entered on the gas analysis form.

ing 4 mesh and retained on 14 mesh screen, and material passing 14 mesh screen.

It was found that an average of approximately 30 per cent of the total material in the fills ranging from 3 to 120 months in age was large enough to be retained on a 4 mesh screen, the greatest portion of this being mineral matter. Approximately 20 per cent of the total passed the 4 mesh and was

retained on the 14 mesh screen, most of which was ashes. The remaining 50 per cent passed the 14 mesh screen and was partially disintegrated and unrecognizable organic matter. Most of the analyses hereinafter mentioned were made on the material passing the 14 mesh screen.

One of the principal elements of organic compounds being carbon, it was found advisable to obtain an indica-

TABLE 3  
Parts per Million of Organic Nitrogen in Residue III

Age (Months)	Top (2' to 4')	Middle (5' to 7')	Bottom (8' to 10')
0-3	1,465	1,540	1,547
3-6	1,522	1,426	1,706
6-9	1,521	1,678	1,539
9-12	1,726	1,605	2,047
12-18	1,471	1,482	1,639
18-24	1,777	1,720	2,329
24-30	1,422	1,504	1,538
30-36	1,585	1,438	1,952
36-48	1,118	1,398	1,625
48-120	1,939	1,970	2,652
360-420	3,116	2,934	2,135

tion of the organic carbon present in land-fills. After trying several methods, the one involving the 2 hour digestion of organic matter using an excess of 50 per cent chromic acid at room temperature, was found to give the best indication of the oxidizable matter present. The results of analyses of the residue passing the 14 mesh screen are shown in Table 2. It will be noted that there is an appreciable reduction in the per cent of oxidizable matter after four years of decomposition in the land-fill. It is difficult to explain the reason for an increase in this matter with depth, except that it must be a characteristic of the placing operations, as the analyses show a consistent increase with depth.

Organic nitrogen is a criterion of protein derivatives present in land-fill material. The results of analyses are given in Table 3. It will be noted that decomposition over a period of four years does not bring about any great reduction in the amount of organic nitrogen present.

The environmental conditions are extremely important in any organic reactions brought about by bacteria and other microscopic organisms. First among these is the pH of the solution in which these organisms act. Table 4 presents the results of analyses of land-fill samples of various ages. It will be noted that the range of pH is from 5.3 to 8.5, with a mean close to the neutral point. This would indicate that the

TABLE 4  
pH Values

Age (Months)	Top (2' to 4')			Middle (5' to 7')			Bottom (8' to 10')		
	Low	Mean	High	Low	Mean	High	Low	Mean	High
0-3	5.3	7.1	8.0	5.4	6.9	8.0	6.0	6.9	8.0
3-6	6.5	7.1	8.5	6.5	6.9	8.4	6.3	7.3	8.4
6-9	—	7.0	—	—	7.0	—	—	6.5	—
9-12	7.05	7.2	7.3	6.5	7.1	7.7	6.0	6.7	7.3
12-18	—	6.9	—	—	7.4	—	—	—	—
18-24	6.9	7.6	8.3	6.0	6.5	7.0	—	—	—
24-30	8.3	8.4	8.4	—	—	—	—	—	—
30-36	—	7.0	—	—	6.3	—	—	7.6	—
36-48	—	—	—	—	—	—	—	—	—

(—) No Data

TABLE 5  
Average Number of Organisms  
Total Plate Count 37° C. — 24 Hours

Age (Months)	Top (2' to 4')	Middle (5' to 7')	Bottom (8' to 10')
	Millions per Gram of Dry Fill		
0-3	73.198	42.280	35.489
3-6	10.920	13.815	12.839
6-9	21.247	73.540	51.928
9-12	0.204	6.412	40.520
12-18	11.031	14.511	25.577
18-24	4.811	4.443	1.239
24-30	12.042	25.281	33.805
30-36	0.031	1.162	0.100
36-48	0.144	0.030	1.230

material is well buffered and provides a favorable environment for bacterial metabolism.

It is interesting to note the number of organisms in the land-fill which will appear on a total plate count at 37° C. This is indicated in Table 5. The trend is obviously toward fewer organisms as the decomposition proceeds and the available organic matter becomes depleted. These large numbers growing on nutrient agar do not begin to show the total number of organisms actually present and taking part in the complex processes involved in the breakdown of organic matter.

Since land-fill material is not of a fecal nature, it therefore should not be high in organisms derived from the in-

testinal tract, such as would be the case with sewage. Analyses of land-fill were made for *Escherichia coli* organisms and the incidence of these is relatively low, as indicated in Table 6. It is obvious that these are not the essential organisms in the decomposition of land-fills.

Fungi are present in much of the food refuse disposed of as garbage and then deposited in land-fills. The numbers of these organisms in each gram of dry fill are of astronomical proportions, as shown in Table 7. The same is true of actinomyces. Both of these groups of organisms are highly active and responsible for much of the breakdown and consequent stabilization of land-fills.

Although the fills may be placed dur-

TABLE 6  
Average Number of *Escherichia coli*  
at 37° C. — 24 Hours

Age (Months)	Top (2' to 4')	Middle (5' to 7')	Bottom (8' to 10')
	Millions per Gram of Dry Fill		
0-3	0.002	0.005	0.020
3-6	0.003	0.001	0.001
6-9	0.039	0.003	0.003
9-12	0.002	0.005	0.005
12-18	0.040	0.004	0.000
18-24	0.000	0.000	0.012
24-30	0.026	0.168	0.034
30-36	0.000	0.006	0.000
36-48	0.019	0.023	—

(—) No data

TABLE 7  
Average Number of Fungi  
at 25° C. — 7 Days

Age (Months)	Top (2' to 4')	Middle (5' to 7')	Bottom (8' to 10')
	Millions per Gram of Dry Fill		
0-3	17.777	23.851	20.162
3-6	57.079	51.452	0.075
6-9	145.572	96.007	198.079
9-12	0.195	25.915	1.431
12-18	228.773	53.107	975.131
18-24	208.274	10.027	8.887
24-30	55.304	43.751	27.609
30-36	0.151	1.658	0.109
36-48	0.000	0.001	12.000

ing the coldest of weather, the material is insulating in character, so that heat is not readily transmitted to the atmosphere. The reactions are thermogenic in nature and bring the temperature of the material to the values shown in Figure 3. These are in the range between the optimum temperatures for mesophilic and thermophilic organisms. Investigations have shown that both types are present and assist in the decomposition.

One of the principal characteristics of land-fills is the dryness of the material

as placed. The large amount of paper and ashes more than counteracts any moisture derived from the food refuse and other moist materials. The moisture content of land-fill material of various ages and at different depths is shown in Table 8. It will be noted that the moisture increases with age and also with depth. These observations are logical because the infiltration of surface rain water will tend to accumulate in the dry material. Furthermore, water will naturally gravitate downward in time. Moisture bears a

FIGURE 3  
TEMPERATURE STUDY  
FAIRFIELD SANITARY LANDFILL  
FOR VARIOUS DEPTHS AS INDICATED  
(COMPARED TO AIR TEMPERATURE TAKEN AT STUDY LOCATION)

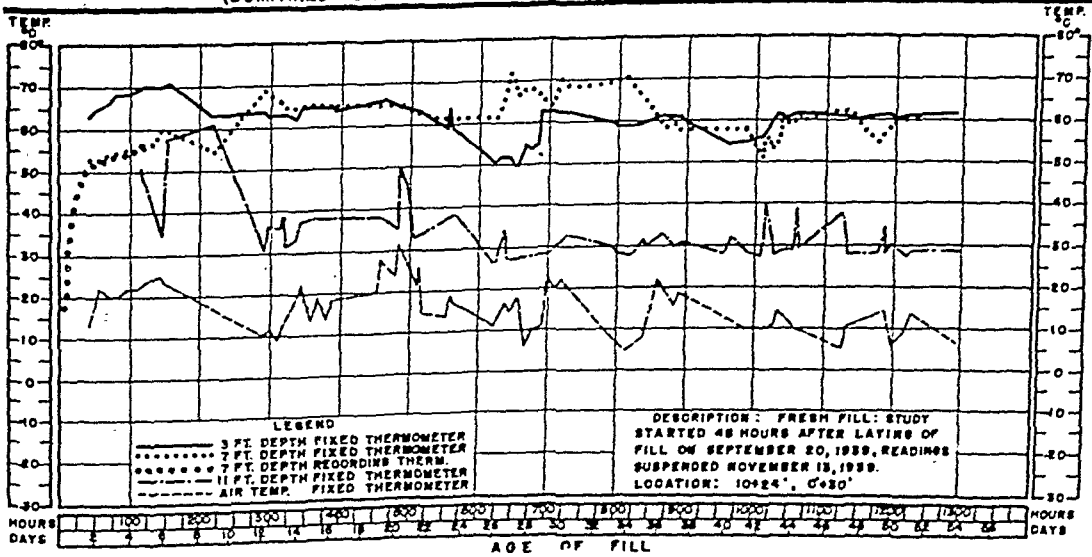


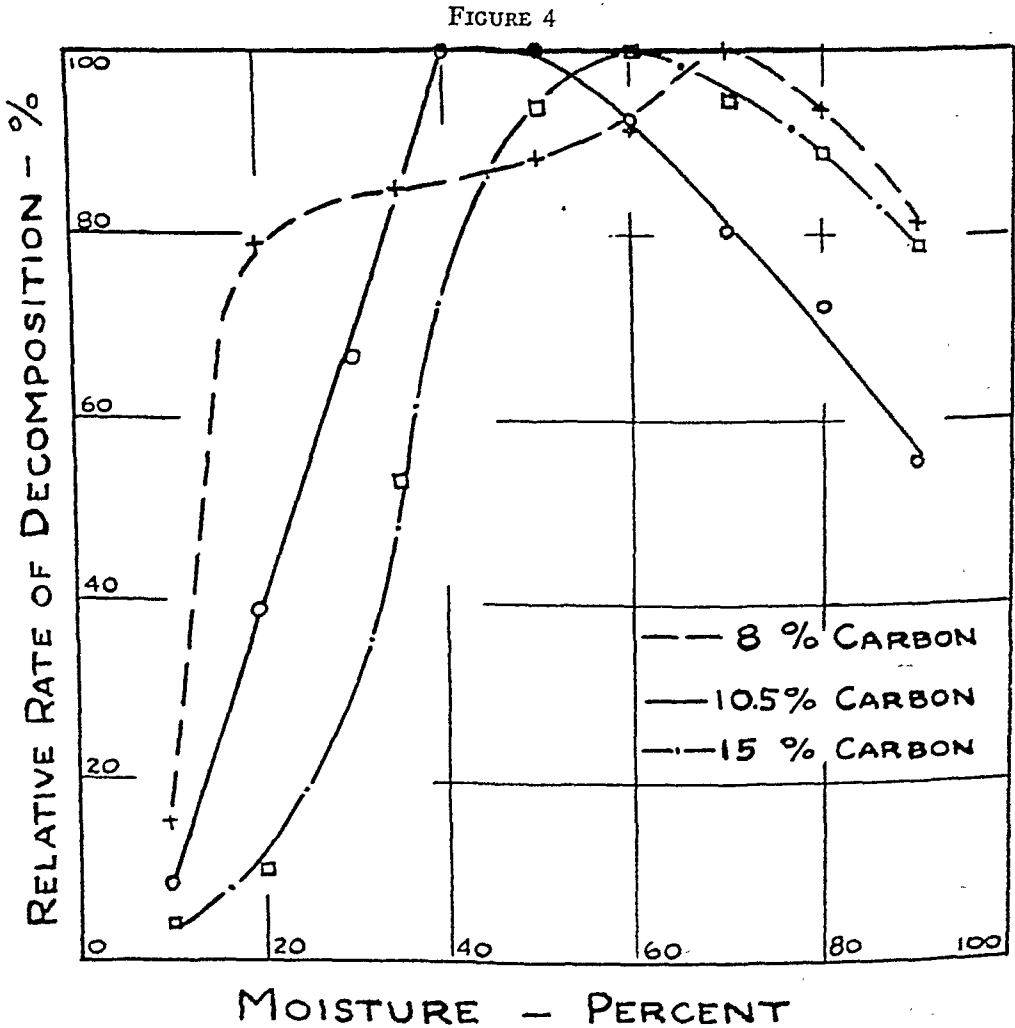


TABLE 8  
*Moisture in Original Sample as Received*

<i>Age (Months)</i>	<i>Top (2' to 4') Per cent</i>	<i>Middle (5' to 7') Per cent</i>	<i>Bottom (8' to 10') Per cent</i>
0-3	18.9	20.9	22.8
3-6	19.2	23.8	20.9
6-9	21.7	24.3	28.4
9-12	24.5	26.7	33.5
12-18	25.2	25.9	31.7
18-24	25.7	30.3	34.3
24-30	20.9	24.1	28.3
30-36	25.5	28.1	32.2
36-48	24.0	28.1	32.4
48-120	21.1	29.5	33.4
360-420	20.9	22.9	21.3

definite relation to bacterial efficiency, as these and other organisms require the presence of water for survival and reproduction.

Studies were carried out to determine the optimum moisture content of land-fill material in an attempt to correlate existing conditions with those deemed



theoretically optimum. The procedure involved comminuting 5 grams of dried land-fill and placing it in a Petri dish with the proper seed of organisms and the necessary water to make up to a given percentage moisture. Decomposition took place at a constant temperature and under aerobic conditions. The criterion of biochemical activity was the amount of carbon dioxide gas produced in a given time. All of the  $\text{CO}_2$  was dissolved in a solution of sodium hydroxide which could be titrated before and after the experiment to determine the consumption of  $\text{NaOH}$  by the  $\text{CO}_2$ . The results of this work are indicated in Figure 4.

These results indicate that for the fresh land-fill material the optimum moisture content lies between 50 and 70 per cent. For older fills the optimum region expands to include values between 30 and 80 per cent. As shown in Table 8, the moisture content of land-fills averages between 20 and 30 per cent and this does not approach the optimum values. These results would further indicate that more rapid decomposition of land-fill could be obtained if additional moisture were added to the fill while being placed. This could be accomplished by having streams from a fire hose play on the material as it is dumped from each truck. Experiments of this type have

been planned and the results will be watched with interest.

Under actual field conditions the air in the fills is rapidly exhausted and the process of decomposition becomes anaerobic. This is evidenced by the results of many gas analyses taken from within the land-fill. The constituents varied considerably but the indications were that the gases averaged 30 per cent carbon dioxide, 45 per cent methane, 3 per cent oxygen, 0.1 per cent hydrogen, and the remaining 22 per cent nitrogen and other inert gases. The high percentage of methane and almost complete absence of oxygen serves to indicate the anaerobic character of the decomposition.

The ultimate object of the decomposition of land-fill is the stabilization of the material so that the ground above may be used for recreational or functional purposes. Further investigation is necessary to correlate the data already collected on settlement of the fills, permissible bearing loads and other factors of an engineering nature. The material presented in this paper should serve to indicate the nature and extent of the biochemical reactions which take place during the decomposition of land-fills.

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1. Carpenter, Lewis V., and Setter, Lloyd R. Some Notes on Sanitary Land-fills. *A.J.P.H.*, 30, 4:385 (Apr.), 1940.

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## HOUSING OF HEALTH DEPARTMENTS

IN the May 22 issue of *Public Health Reports*, the *Housing of Health Departments* was discussed by Assistant Surgeon General Joseph W. Mountin of the United States Public Health Service; and in the July number of the *Architectural Record*,\* the Hospital Facilities Section of the United States Public Health Service made available its *Study of Health Centers*.

In the first of these articles, health department housing, as it is, comes in for severe criticism. The situation is analyzed as to cause or causes, and brief but definite suggestions are made as to remedies. The Study, with a foreword by Dr. Parran and an introduction by Dr. Mountin, provides floor layouts for health centers designed to serve populations up to thirty thousand, sixty thousand, and one hundred thousand respectively. Supplementary data are provided as to office and clinic equipment, clinic loads, and even clinic schedules are suggested. One might, with reason, feel that there is a bit too much minuteness in some of this, perhaps more certainty in detail than is justified, but it is a valuable document and one to be studied and acted upon.

Of equal importance with the recommendations made in this study, probably of more importance, is the necessity for eradication of that attitude in health officers, public officials, and the public generally, which in the past has inhibited the provision of decent housing of health departments; and there must be developed, too, a state of mind which will insure proper quarters in the future. In retrospect one may see quite clearly that no small part of the present unsatisfactory situation arose because the launching of full-time local health service has always been an up-hill fight. The state health officer promoting such service has been forced to make compromises of all sorts in order to get a toe-hold for local service. He has had to approach the whole problem with over-emphasis on how little it would cost the community; he has occupied the rôle of supplicant and seldom has he been in position to lay down minimal requirements as to anything, to say nothing of health department quarters. And the

\* Copies are available upon request from the A.P.H.A. office.

local health officer, in accepting, selecting, or equipping quarters, has had to be somewhat careful lest, to the jeopardy of his whole program, he label his work as foreign, by failure to acquiesce in the shirt-sleeve and tobacco-spitting type of local administration seen in most small units of government.

Perhaps there has been justification in the acceptance of expedients and compromises in health department quarters. It may be that if this had not been done many communities which now enjoy health service of a sort would not be as well off as they are. As against this, though, is the ever-present danger that compromise measures tend to freeze into permanent practices; that a tuberculosis service, at first maintained on a high plane in spite of all difficulties, may sink to the level of inadequate facilities; that the insanitary condition of health department quarters as a whole and the unpleasant odors of the venereal disease clinic, in particular, at first distressing to doctor and nurse alike, are sooner or later accepted through dulling of the sensibilities. That this is what ordinarily happens, there can be no doubt; and the correction of it will be brought about only by strong, concerted, and continuing action and assistance under federal, state, and foundation leadership.

On the positive side, separate, and distinctive, quarters have much to commend them. Aside from providing an opportunity for more nearly adequate and better work, the presence of a dignified and inviting health center has an important bearing upon the amount and kind of use which the community will make of the health services, and the regard in which the public holds the health department. It may not be logical, and from the standpoint of clear thinking perhaps it should be deprecated, but the fact remains that the public is not inspired by the light under the bushel, nor is John Citizen impressed by something he cannot see. He wants concreteness, an emblem, a symbol. He appreciates length, breadth, and thickness more than he does an abstraction. Thus, in an association-of-ideas test, to the word "education" he would probably respond with "school"; to "religion" his reply would perhaps be "church"; and to "United States Mail" he would in all likelihood say "post-office": all these responses represent three dimensional concepts, in terms of buildings. What would be the response today if to the average small town citizen one suddenly said "health department"? Perhaps there would be no association, or possibly it would be "basement" or "dingy" or "the old school house." As a remedy for this we need to bring about such an attitude on the part of the public that in an association-test situation, the person tested will upset the procedure; that the mere voicing of the term "health department" will arouse him sharply from the semi-lethargy necessary for free association, and he will with alertness and interest and enthusiasm exclaim: "Oh, you mean that spick and span Health Center, where such excellent service is rendered, and which is by far the best investment we ever made." Only we hope he will say it less pedantically.

## THE SULFA DRUGS AS PRODUCERS OF EMOTION

ONE can understand why emotions flash when a subject such as socialized medicine is introduced into a discussion. In such circumstances it is more than likely that the discussers visualize themselves as parties at interest or in jeopardy, or that one arguer has a low opinion of someone who is in favor of

socialized medicine and another has a low opinion of someone who is against it, or very much vice versa.

It is natural that in a situation of this sort emotions rather than logic influence both the pros and cons and, because the problem is more closely related to sociology than to science, the approach is philosophical rather than scientific. But it is a little difficult to appreciate the psychological reaction of those who become red faced and vehement in discussing the efficacy or lack of efficacy and the dangers or lack of dangers of a therapeutic agent, such as the sulfa drugs. On the one hand is found the practitioner who has less fear of such a drug than of aspirin; who advises and prescribes it for anything and everything, who in no way checks upon the reactions to the drug, and considers that he has wrought a cure unless he has to sign a death certificate. With an experience of this sort behind him, this physician is prepared to take on any colleague who has the temerity to argue against the soundness of his procedure and the magic of the drug. As opposed to him, and certainly someone should oppose him, is the individual who reacts unfavorably to almost anything that is new, who is an avid collector of records of untoward results in sulfa-drug therapy, and who, tending to forget all benefits that have accrued, roundly denounces this new chemotherapy as an invention of the devil.

Perhaps it is in discussions of the treatment of gonorrhea with sulfa drugs that one encounters the most vehement arguments. Enthusiasts will imply a desire to place packets of sulfa drug tablets in slot machines and let whoever has gonorrhea and twenty-five cents try his luck. Others, at the mere suggestion of sulfa drug efficacy in shortening and curing the disease, become so incensed that they charge the drug with "creating" gonorrhea carriers. Few informed persons would be prepared to acquiesce in either of these extreme views. Which is the more nearly correct is not here the issue. The point to be emphasized is that the true place of the sulfa drugs in general and especially in relation to gonorrhea will be reached much more quickly through an objective approach and a minute sifting of evidence than through emotional support of a prejudice in either direction.

## WHAT AND WHO IS AN EPIDEMIOLOGIST?

*Comments on an editorial published in the April, 1942, issue of the JOURNAL*

From one of the Old Masters, L. L. Lumsden, M.D., Medical Director (Ret.), U. S. Public Health Service, New Orleans, La., comes this analysis:

Definitions are always difficult and often unsatisfactory, with one just calling for another. However, the editorial in the April, 1942, issue of the JOURNAL on "What and Who Is an Epidemiologist?" is to us, who for some time have been striving to earn the title, provocative and even challenging. Furthermore, the defining of epidemiologist is no more nor less difficult than is the defining of physiologist or pathologist. The writer of the editorial evidently realizing the difficulty of satisfactory

defining, gives an "assist" by asking a number of questions, the invited answers to which might serve to furnish a definition by a sort of process of elimination. So here goes at the answers:

- Q. "Are epidemiologists born or made or just self-confessed?"
- A. They must be both born and made. Being just self-confessed is not enough.
- Q. "May the clinician, the statistician, the bacteriologist properly designate himself as an epidemiologist?"
- A. No; but any of them, notwithstanding or even in spite of his former predilections,

may become an epidemiologist by proper application and by having what it takes.

- Q. "Can one be an epidemiologist and something else besides?"
- A. Yes. Outstanding in the all-time list of epidemiologists have been Pasteur, a chemist, Jenner, Budd, and Snow, practising physicians, and Sedgwick, an engineer.
- Q. "Does the first-hand experience of a quarantine officer take him within the fold?"
- A. No.
- Q. "What about one who, in retrospect, studies the data of past epidemics; and the medical historian with intimate and detailed knowledge of the classic writings in epidemiology?"
- A. They may be regarded as academic but not as practical epidemiologists or going concerns.
- Q. "One who concentrates upon a single disease—its laboratory, clinical and epidemiological aspects—is he an epidemiologist in general or only in particular?"
- A. He may be both. If Reed and Goldberger had done no epidemiological work except what they, respectively, did on yellow fever and pellagra, they would have held high rank as epidemiologists.
- Q. "May one not formerly an epidemiologist reach this state merely by being given responsibility for epidemiological work?"
- A. No; in years past, we have seen, off the job, enough of this sort to make us sure.
- Q. "If once an epidemiologist is one always an epidemiologist?"
- A. No; some of them become lunatics.
- Q. "Is epidemiology a status that may be conferred by acclamation or announcement?"
- A. Perhaps under some circumstances, but as a rule only for purposes of sociability.
- Q. "Does portentousness of manner and mien tend to cause colleagues to accept one as an epidemiologist?"
- A. Yes, at times, but it never should.

Now, having got this far along, here goes at home-made definitions of "What and Who."

### *What?*

An epidemiologist is one who is importantly concerned with or essentially engaged in broad-gauge and intense studies, including field observations, of conditions known or reasonably supposed to influence the occurrence of

disease. Who says "importantly," "essentially" and "reasonably"? The epidemiologist himself does, and who shall say him nay?

This leads to

### *Who?*

One who does well enough epidemiological work to deserve recognition.

### *Recognition from Whom?*

Answers to that would vary much according to the audience interrogated. For convenience, we may start off with the judgment of those who from study, training, and experience have technical knowledge of epidemiological procedure and end up with the common opinion of mankind. A detective who solves a murder mystery and an epidemiologist who solves an important disease-causation problem usually obtain favorable popular recognition. But some of the highest grade epidemiological work does not result immediately in an important discovery, but builds up, step by step, a structure of facts by which eventually someone else may climb to the light.

No standard of qualifications for an epidemiologist has been set up by authority. Therefore, the decision as to who in our midst is an epidemiologist is wide open. He should be judged by his works. Among some of the distinguishing features which are helpful in the establishment of his identity are the following:

1. He has in his makeup two essential elements—common sense and the will to work.
2. He applies his common sense in formulating his program of studies and in interpreting and presenting his findings.
3. To him facts are all important. He goes after them and gets them, and in collecting them he is diligent, patient, careful, thorough and unbiased.
4. He endeavors to put together the facts so as to make a simple, readily readable picture.
5. In his presentation of findings, he avoids needless or obfuscating high mathematics and formulae.

6. He bases his conclusions on the factual evidence and he does not twist the facts to try to make them appear to conform to some favored previous concepts of himself or others.

7. He remains broad-minded and open-minded throughout his procedures.

8. He is humble in his ignorance but bold in his search for truth.

9. His doctrine is that of Montaigne's ancient sailor who in the midst of a great storm said to Neptune: "O God, thou shalt save me if thou please, if not thou shalt lose me; yet will I keep my rudder true."

Joseph C. Willett, D.V.M., Chief of Laboratories, City of St. Louis, comments as follows:

In view of what has been said, as well as some of the omissions concerning epidemiologists, may I venture that an epidemiologist is one who by virtue of training, experience, and actual demonstration, is capable of recognizing, investigating, and appraising all of the circumstances (obvious and otherwise) connected with the occurrence of disease in man or animal and consequently discovering the essential basic factors (source, etiology, distribution, incubation, etc.) necessary to disease control and prevention.

As in other fields of endeavor, we must recognize the capabilities of different epidemiologists—if we were to define "detective" as a person capable of recognizing and investigating all the circumstances connected with crime, we would still distinguish between the arm-chair Sherlock Holmes and an accomplished operative of the FBI.

Yes, even grandma, who recognized

all of the diseases of childhood and perhaps knew something about the "circumstances connected with their occurrence," was an epidemiologist, as was grandpa, who possibly knew a lot about hog cholera. However, in modern preventive medicine our epidemiologists must have better basic training—yes, even better than that afforded by the present medical or veterinary schools.

The bacteriologist, clinician, statistician, of which you speak may be epidemiologists with the same degree of success as the average intelligent non-arthritic layman attains in forecasting the weather.

Possibly we could better appraise the practical worth of our epidemiologist if we looked to the thickness of the callouses on his feet, and the number of successful epidemic investigations to his credit, as well as to the kind and number of letters after his signature.

C. E. Dolman, Ph.D., D.P.H., Professor of Bacteriology, University of British Columbia, Vancouver, B. C., sends this letter:

When I asked the above question of three colleagues, they replied respectively: "a transportation expert," "a contact tracer," and "a totipotent sleuth." The expertness my first colleague (a bacteriologist but no cynic) had in mind related to the tracing of the most likely route for a given pathogen to have travelled, rather than to the working out of the most expen-

sive way for an epidemiologist to have made a given trip. The second colleague was a venereologist, and so may be excused for his definition. The third had been an epidemiologist too recently for all bitterness to have mellowed. Although there seems nothing essentially wrong with any of their replies, the most satisfactory definition of an epidemiologist is surely the simplest and

most literal, that he is a person who looks into, deals with, knows about, and treats of epidemics.

But I should judge that this dissection by correspondence of the epidemiologist was initiated not so much to determine more accurately his structure and functions, as to help define his status and strengthen his hand. The junior epidemiologist's lost look, and the senior's "portentousness of manner and mien," are not altogether their fault. Any of us might well feel baffled if, knowing our job was to look into epidemics, we were apt to find ourselves on the scene too late to make a first-class investigation, and were met on arrival with conflicting answers to almost every question; if, in attempting to deal with the epidemic, we were often balked by lack of clear-cut authority; if, in trying to persuade at least ourselves that we knew about epidemics, our self-esteem was sometimes shattered through the specimens we had assiduously collected being mocked at or spurned by the laboratory, and through our carefully illustrated itinerary being consigned, without praise or blame, to some dark file in a central

office; and especially if, in an endeavor to "treat of" some epidemic publication of our findings was banned because of feared legislative complications.

Such difficulties as these do not refute, but only emphasize, the need for more and better epidemiologists. Together with his public health laboratory colleague, the epidemiologist furnishes most of the information on which any sound health department program is founded. Yet these persons seldom occupy the honored place in the departmental hierarchy to which their objectives and training entitle them. What they lack is not responsibilities, but prestige; and this cannot lean on tradition, even when, from Fracastoro to Snow, from van Leeuwenhoek to Pasteur, the tradition has been compounded of integrity, scholarship, courage, and leadership. But these very attributes are still recognizable enough to bring prestige to those who manifest them. When this is fully realized, and the epidemiologist, turning to his laboratory colleague, grows in every sense attached to him, they will wax strong together, to their own and their community's lasting benefit.

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This discussion will be brought to a close in the November issue.—EDITOR



# Credit Lines

A Selective Digest of Diversified Health Interests

D. B. ARMSTRONG, M.D., AND JOHN LENTZ, M.S.

## REAL HEALTH EDUCATION

*The Scene:* A county health department.

*Characters:* A health officer, a mother, and a nurse.

[*Enter, the nurse*]

*Nurse:* "Doctor, Mrs. Cook is here to see you. She insists on talking with you personally, although I suggested that she might see some other doctor on the staff. She only wants to know about taking the Pasteur treatment."

*The Health Officer:* "I should be at the immunization clinic now. Perhaps it won't take long—send her in."

[*Mrs. Cook enters accompanied by the nurse. It is evident from her expression and actions that she is disturbed and anxious.*]

*The Health Officer:* "I'm glad you've come to the health department, Mrs. Cook. I believe you've never paid us a visit before. I know your community pretty well—seems we should have met long before this."

*Mrs. Cook:* "I feel that I know you already, Doctor. I've heard the children speak of you and I've read in the papers about the work you are doing here."

*The Health Officer:* "The nurse tells me that you want to inquire about the Pasteur treatment. Now, just what is your question?"

*Mrs. Cook:* "My 12 year old son agreed to tend the cows of our nearest neighbors while they were away on a short vacation. One of the cows acted queerly and my son tried to find out what her trouble was. He knows how to care for livestock, and in attempting to give the cow some medicine, he got a nip on the hand. Finally, a veterinarian was called and he said the cow had rabies. By the time we got the animal's head to the laboratory, the doctor there said he could not make the tests to tell whether or not the animal was actually mad as the head was too far decomposed."

*The Health Officer:* "Yes, that often happens. The head must be well preserved or the laboratory man will be unable to locate certain characteristic structures that show up in the brains of animals that have rabies."

*Mrs. Cook:* "And that's just why I'm so disturbed, Doctor—not knowing whether or not my boy is in danger. I know that rabies is fatal once it develops and of course I want him protected if there is the slightest chance that he might have it. But I'm also afraid of those 'shots'—I've heard they are dangerous, that they don't always work, and that the injections cost a lot."

*At this point the health officer might have made a few statements urging the mother to have her son protected, regardless of what she had heard about the "shots." But here was a woman*

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*who had never been to the health department before—and thus there was an opportunity at hand to make another advocate of public health, another opportunity to impart health education. Thereupon, the health officer called for his records. He cited the number of Pasteur treatments given in his department over a period of years, he told how the injections were administered, he pointed to the various age groups that had been treated, and he emphasized the generally successful results and the lack of complications arising from the administration of the vaccine. He might have stopped there, but there was still other evidence to reassure this mother.*

*[Turning to his bookcase, the health officer drew from its shelves a well known textbook on public health and hygiene.]*

*The Health Officer:* “Mrs. Cook, perhaps our experience here does not clear up all your doubts about the value of this treatment. Well, here’s a textbook that every public health man in the country looks upon as a sort of Bible of the profession. Let’s see what the author has to say about the Pasteur treatment.”

*[And thereupon the health officer read aloud to Mrs. Cook sections of the chapter on rabies that would help to dispel her anxiety. She listened attentively as the health officer read and translated the author’s phraseology into simple, readily comprehended terms. An observer could see this mother’s doubts and fears and uneasiness vanish as steam is wont to vanish into thin air.]*

Mrs. Cook took leave of the health officer reassured, composed, and grateful. She might have left under far different circumstances had not a busy, harassed, sympathetic health officer

taken time to give her facts and figures as to his own experience and that of others regarding the efficacy of the Pasteur treatment. Perhaps he was late at the immunization clinic, but what better evidence could be offered that his time had been well spent than Mrs. Cook’s parting remark: “Now I understand, Doctor. I’ll have my son here in the morning to begin those ‘shots’ regardless of what they cost. I’m going to tell him what you’ve said—and neither he nor I will be afraid!”

This, it strikes us, is health education at its best and proof that the health officer can be the most effective of all health educators.

#### AN EDITORIALETTE:

##### HEALTH IN WARTIME FOR THE “UNDER SIXES”

Herewith we present our second guest editorialette, submitted in response to invitations extended in these columns during recent months. Miss Marjorie L. Craig, of the School Health Bureau, Welfare Division, Metropolitan Life Insurance Company, has written the following:

The importance of the young child’s health has long been stressed by leaders in public health through their excellent programs on maternal and infancy care, including diphtheria immunization and vaccination against smallpox. The public health profession is now being called upon to give more attention to all the “under sixes.” Many problems of the preschool child have been accentuated by war conditions, and action has become more urgent. Housing facilities, particularly in industrial areas, are inadequate, sanitary conditions are unsuitable, and the possibilities of contagion and poor general health are amplified. The war has brought about new fears and insecurities and has created fewer opportunities for good emotional hygiene and social growth. The health of some 10 million “under

sixes" has real significance in the war program. Military and industrial men and women must have faith in the security of their children before they can give their most efficient service. New emphasis is being placed on providing for children the best possible kind of physical, mental, emotional, and social environment which is basic to a nation's security in any era.

Charles Schottland, formerly of the Children's Bureau, has been appointed to the Office of Defense, Health, and Welfare to coördinate the services for children offered by health, welfare, and educational agencies. All over the country, organizational interest is being submerged and is giving way to the wholesome development of the individual child as uppermost in the minds of those responsible. New programs for young children are springing up rapidly and it is hoped that the public health profession will coöperate in making available health facilities consistent with accepted standards. Nursery schools, day nurseries, child care centers, and other services are essential if today's children and the children of the future are to have opportunities for American life and the liberties for which we fight on every front.

(EDITORIAL NOTE: These columns are still open to other contributors. Please let us have your comments on any subject—preferably with a health education slant. While we cannot guarantee publication, serious consideration will be given to all material submitted.)

#### NOTES ON PUBLICATIONS

You will want to see:

*Record of Service, 1940-1941*, the biennium report of Memorial Hospital for the Treatment of Cancer and Allied Diseases, 444 East 68th Street, New York, N. Y.

"The annual report of a hospital

should provide more than an accounting of the expenditures of funds and a recounting of routine activities. The statement should convey to the reader the spirit which animates the institution, the ideals to which its personnel aspires, and the ends which they wish, and presumably expect, to attain."

Upon this premise, Memorial Hospital has based its latest report. That it reflects in a most admirable manner the spirit, the ideals, and the scientific and humanitarian principles underlying the work of this great institution is but faint praise for such an excellent summary. The text, for the most part, is devoted to the promising research studies which the institution is pursuing "to ferret out the cause of the mysterious, malignant disease which we call cancer and detest as such." One finds in the pages of this report many hopeful developments looking to the control of this disease, particularly as regards the more recent chemical and nutritional approaches to the problem. Of especial interest also is a section of the report dealing with the social and economic aspects of cancer. The institution recognizes that one of its chief tasks is "to bind up the mental, social, and economic wounds of those devastated by this disease." We know of no current statement, either of a popular or scientific character, that so succinctly analyzes and appraises current efforts and future possibilities in the field of cancer research. The report has other features of note including an attractive cover depicting, by means of a photo-montage, various functions of the hospital. The report is also well executed typographically.

(In connection with the report of Memorial Hospital, we wish to air one of our pet "causes." This publication, like so many others in the medical and public health fields, employs as a title page decoration, the caduceus. While the symbol of the staff, the intertwined

serpents, and the pair of wings is commonly used to represent the healing art, it is not the *true* symbol of the profession. The authentic symbol of medicine is composed of the knotted staff of Aesculapius, the divine healer, wound with a single serpent. It appears in a very few publications. The precedent for using the caduceus, rather than the staff of Aesculapius, goes back to Johann Froben, a Swiss medical printer who lived several hundred years ago. Froben, with an eye for symmetry, preferred the caduceus to the less decorative Aesculapian staff—and thus it came into use as Froben's books were widely circulated among medical men. If authenticity is the quality for which we strive in health and medical publications, why should this not apply even to devices used purely for decorative "touches"? Down with the caduceus! Up with the staff of Aesculapius!)

*The Well-Filled Dinner Pail*, a folder published by the Iowa State Department of Health, Des Moines, Ia. Single copies offered without cost.

Today, more than ever before, housewives are faced with that perplexing question: "What can I prepare for my husband's lunch that will please him and keep him fit for the job?" Generally, the worker's lunch has lacked variety and appetite appeal. Thanks to the Iowa State Department of Health, suggestions have now been set forth that will make any man look forward to the lunch hour. In this publication, complete menus are outlined for every working day—each menu being planned to supply the body's mechanism with "high octane gas" for the vital jobs that are being done. There are also suggestions in this folder for the preparation of "hearty sandwiches," with a wide variety of unusually tempting and nutritious fillings. Tips are also given concerning hot and cold drinks, raw and cooked fruits and

vegetables, and desserts. This timely and practical publication should be had by every housewife who faces the daily chore of preparing lunches for working men. The folder is neatly printed in red and blue and the text is conveniently arranged for ready reference.

*Good Teeth*, a publication issued by the Metropolitan Life Insurance Company, 1 Madison Avenue, New York, N. Y. Available without cost.

Current interest in dental health, stimulated to a large extent by the number of draftees who were pronounced dentally unfit, has made the need for educational materials in this field more urgent than ever. Accordingly, the Metropolitan has revised its booklet on the teeth with the coöperation of the American Dental Association in order that the most authoritative information on the more important and practical phases of dental health might be made available to the public. The text is simply written and a variety of charts, illustrations, and diagrams are included to emphasize some of the more important aspects of the care of the teeth.

*Diphtheria and Smallpox Can Be Prevented*, two leaflets issued by the Kansas State Board of Health, Topeka, Kans. Available without cost.

Here are two publications notable for their brief, explicit, informative content. Although they lack illustrations and fancy art work, these leaflets win attention readily as bright colors are liberally used on the covers. Each leaflet also contains quotations from what is presumably the Sanitary Code of Kansas, citing the law with respect to reporting, placarding, quarantining, and the like, in cases of diphtheria and smallpox. This is a somewhat unusual feature—one which we have not seen embodied in popular health education materials heretofore, and perhaps of

special interest to physicians. Since few laymen and not all doctors are familiar with legal provisions of this nature, it seems that other states might well use the same medium to publicize their legal safeguards regarding communicable diseases.

*Hartford Health Bulletin*, a monthly periodical published by the Hartford Board of Health, Hartford, Conn. Copies available on request.

This bulletin, which is simply and economically produced, is at the same time highly interesting chiefly because it is prepared by someone with a keen sense of news values. The issue at hand, for instance, features several stories in which current health activities are "played up" in relation to the war effort. On the cover, a "Victory Health Program" is outlined in a rather ingenious layout consisting of a large V in which the following essentials are printed: outdoor exercise, varied food, restful sleep, frequent health examinations, vaccination, immunization, child care, sanitary homes, personal hygiene, hard work, community interests, early medical care, and regular dental care. This bulletin also carries an excellent statement in which the practical aspects of the nutrition program, especially as applied to war workers, are emphasized. If there is any health officer who can speak with first-hand knowledge on this subject it is the health officer of Hartford as his community is the center of a vast amount of our industrial effort. Dr. Alfred L. Burgdorf, the Hartford Health Officer, and his associates may well be proud of the bulletin which they issue.

#### CONCERNING POSTERS AND EXHIBITS

One of the country's leading advertising agencies, Young and Rubicam, Inc., recently completed a study of war posters that have been exhibited in

Canada during the past two years. The purpose of this study was to determine the type of poster that has been most successful in mobilizing the Canadian people in support of the war effort. It was felt that such a study might produce knowledge that would aid materially in the production of effective war posters by our government. Health educators will find many of the conclusions interesting and perhaps valuable as "pointers" that should be considered in the preparation of health posters.

Among the conclusions reached are: (1) The most effective war posters appeal to the emotions. No matter how beautiful the art work, how striking the colors, how clever the idea, unless a war poster appeals to a basic human emotion in both picture and text, it is not likely to make a deep impression. (2) The poster should be a picture, not an all-type poster or a symbolic design. And by a picture is meant a true and literal representation, in photographic detail (though not necessarily a photograph) of people and objects as they are, and as they look to the millions of average people. If it isn't such a picture, it is not likely to make a powerful appeal. Abstract design and symbolism are to be avoided, as they are likely to be misunderstood or not understood at all. (3) Unlike humorous commercial posters, humorous war posters do not attract so much attention, nor do they make so popular an appeal as emotional or even factual posters. Moreover, some people definitely dislike humorous war posters.

Since we have frequently criticised certain health posters of symbolic design, we confess to a "We-told-you-so" feeling in connection with the conclusions reached in this study concerning posters executed along these lines. The study reveals that symbolic posters are misunderstood by one in four who see them. Moreover, they do not at-

tract a great deal of attention and they fail to arouse enthusiasm. This brings to mind a story of a poster that was under consideration by a government agency in Washington. A top-flight artist had prepared a design that employed a great deal of symbolism. It was "previewed" before release by twelve individuals—each of whom had his or her own interpretation of what the poster was supposed to convey. Two out of twelve came very near identifying the message, while the others missed the point completely! (Yet, surprisingly enough, the Russians use a lot of symbolism in their supposedly successful posters! How come?)

The National Tuberculosis Association, through its Health Education Advisory Committee, is now issuing a monthly series of posters for display in industrial plants. The posters are produced in sets of four and may be obtained from local tuberculosis associations throughout the country free of charge. Each poster measures 8 inches by 11 inches and is executed in two colors. The most recent series is devoted to physical fitness, cleanliness, exercise, and the necessity for early medical care. They are ideally suited for bulletin board display in that the captions are brief and pointed and the illustrations simple and appropriate. Health educators should be able to use the posters to advantage, especially in defense areas.

"Effective exhibits were never more important in the health education scheme of things than today." With this opening sentence, the State Committee on Tuberculosis and Public Health of the State Charities Aid Association, 105 East 22nd Street, New York, N. Y., proceeds to discuss in a new brochure certain essentials or "musts" that should be followed in preparing and displaying tuberculosis exhibits. Among the topics

considered are: adapting exhibits to particular groups or audiences, establishing a central theme, selecting current motifs, and choosing exhibit materials. Concerning "coöperative exhibits," the brochure states: "Don't hesitate to 'team up' with other agencies for exhibit space. Sacrifice independence if by so doing you can obtain a preferred location. The best of exhibits fail if out of the line of marching feet. Securing a preferred location is more than half the battle." The brochure is published under a rather ponderous title: "Health Exhibits—For Any Time and Place by Tuberculosis and Health Associations." Write to the agency at the address given above for copies.

#### "KEEP WELL" CRUSADE

The forces of health education recently gained a strong ally when the Institute of Life Insurance launched a national health campaign built around the theme, "Keep Well and Help Win the War." During June, July, and August, the Institute sponsored a series of five health messages that appeared in newspapers with a combined circulation of 22 million. The keynote of the campaign was expressed in a set of five simple, fundamental rules of good health, formulated in collaboration with Surgeon General Parran of the U. S. Public Health Service, Dr. Morris Fishbein of the American Medical Association, the Medical Information Bureau of the New York Academy of Medicine, and other leading medical and health authorities. These rules were: Eat Right, Get Your Rest, See Your Doctor Once a Year, Keep Clean, and "Play" Some Each Day. In addition, the copy of these messages stressed personal fitness as a patriotic duty to relieve the medical, nursing, and dental professions now seriously overstrained by the increasing demands of the armed services. Life insurance agents were also mobil-

ized in this campaign to spread other health materials prepared by the Institute. This drive to conserve the health of the American people was no doubt of substantial benefit and many health educators have expressed appreciation of the Institute's efforts to help carry the story of good health throughout our nation.

Perhaps the most effective item among the Institute's promotional materials was a poster setting forth the health rules. For simplicity of expression, this poster has seldom been equalled. Generally, when rules are formulated they take on a certain "school teacherish" tint, but in this poster the health advice is put in a refreshing way so that one does not look upon them as "rules," but rather as essentials that one would wish to adopt for good, orderly living. Moreover, the copy brings out certain points that have not been stressed before—for instance, visiting with friends is recommended as a wholesome form of relaxation. In brief, this is a successful poster—both as to copy content and illustrative material. Perhaps the Institute of Life Insurance would permit health agencies to copy it for local use. If interested, write to the Institute at 60 East 42nd Street, New York, N. Y.

#### MORE ABOUT JARGON

From time to time we have sounded off on the subject of professional jargon. Now Bruce Bliven comes along and does likewise in his first-rate book called "The Men Who Make the Future." Mr. Bliven, we think, hits the nail on the head in the following excerpts:

"Today many scientists, in America no less than elsewhere, believe it is not only undignified but in some way improper to express yourself simply and clearly. There is a doctrine of obscurity which goes straight back in an unbroken line to the mumbo jumbo of the voodoo witch doctor whose patients would never get well if they understood what

he was talking about. It is also allied to the professional bad handwriting of the doctor preparing a prescription. It is a close first cousin of the ponderous verbiage of the lawyer for which there is only one justification: the effort to convince the client that an otherwise dispensable adviser is indispensable. (For an example of the lawyer's reluctance to think straight or write straight, consult your income tax blank, a masterpiece of rhetorical incompetence.) The cult of unintelligibility in our academic life is directly connected with the Germanic tradition in higher education that has done us so much harm these past fifty years, in stressing ever narrower specialization, scholarship for scholarship's sake, the importance of piling one triviality upon another until through a towering monument of uselessness, the scholar's reputation is established.

"In the very recent past, one of the ablest British scientists now living was blackballed for membership in the Royal Society, apparently for the sole reason that he wrote so well that even laymen could understand him. If you want to see the evil influence of this attitude, go to any meeting of any scientific body and listen to the really frightening jargon in which some of the very young scientists couch their papers. It is quite true of course that certain scientific matters cannot be described without using a technical vocabulary, and that mathematical formulae are usually unintelligible to anyone who has not had special training. But the obscurity of many scientists goes far beyond these necessary conditions. For proof of this, I offer two facts: First, that many scientists get simpler and clearer as they grow older: their worst stage is usually when they are showing off as newly fledged Ph.D.'s at a scientific meeting; and second, that the leaders are usually among the best writers."

#### MAGAZINE ARTICLES

Recent popular magazine articles on health or of medical import:

"The Great Art of Getting Well." Marshall Sprague. *Good Housekeeping Magazine*, August, 1942.

"Worries Are Family Termites." William M. Marston. *Better Homes and Gardens*, August, 1942.

"Mumps." Herman N. Bundesen, M.D. *Ladies' Home Journal*, August, 1942.

"How are Your Nerves?" James S.

Warren. *Cosmopolitan Magazine*, August, 1942.

"Formula for Fitness." Ryllis and Omar Goshin. *Cosmopolitan Magazine*, August, 1942.

"Hotels into Hospitals." Charlotte Muret. *Harper's Magazine*, August, 1942.

"Medical Action at Pearl Harbor." W. H. Michael. *Harper's Magazine*, August, 1942.

(The above is not presented as a complete list and the articles cited are not necessarily recommended.)

#### JOTTINGS

Education of the public regarding methods for the prevention of mosquito breeding may take on a new significance in some parts of the country as a result of the rather clear identification of the rôle of a common variety of culex mosquito in the transmission of equine and St. Louis encephalitis. Recent epidemic experience in the northwestern part of the country has rather definitely incriminated at least one variety of the culex mosquito as a vector and a reservoir of the encephalitis virus. Heretofore, extermination of this type of mosquito has been undertaken primarily for reasons of comfort. It now appears that this insect may be a very formidable enemy of health, making its extermination an important measure in disease prevention. . . . While it is perhaps a little out of the field of this column, we cannot resist commending to all readers in the public health and medical fields the very unusual paper by Dr. Walter C. Alvarez of Rochester, Minn., on the subject of Constitutional Inadequacy. This paper appeared in the *Journal of the American Medical Association*, July 4, 1942. Few writers have presented in so short a compass as much basic material contributory to an understanding of the limitations and resources of our friends, our fellow workers, and ourselves as does Dr.

Alvarez in this paper. . . . Although the appointment of Dr. Ernest L. Stebbins as Commissioner of Health of the City of New York was announced in the last issue of the *Journal*, we wish to extend our somewhat belated congratulations to him in behalf of all those engaged in health education. Dr. Stebbins's position is one of outstanding importance both locally and nationally. He is highly qualified to fill the post and under his direction it is expected that the health education activities of the department will be carried on with all the resources circumstances afford.

. . . Another gratifying appointment is that of Dr. Frank Calderone as Secretary of the Department of Health of the City of New York. Dr. Calderone assumes this important position after a long and varied experience as a health officer and public health teacher. . . . The increasing toll of industrial accidents in war plants and of accidents affecting war workers has led the National Safety Council to intensify its educational program in this field. Activities of the Council directed toward the elimination of accident factors are being expanded under the direction of Dr. Ned H. Dearborn, newly elected executive vice-president and managing director of the Council. A goal of 5 million dollars has been set to meet the needs of the Council's enlarged educational program. In addition to direct aid to industry, a portion of this fund will be utilized to assist local safety councils and organizations interested in industrial, home, farm, and street safety. . . . A series of articles on various phases of the school health program that merit the thoughtful consideration of all medical and public health personnel is found in the *New York State Journal of Medicine*, issue of August 1, 1942. These articles are indicative of the efforts that are being made to place school health programs on a more comprehensive and genuinely



educational footing. . . . Two excellent films dealing with industrial hygiene are now available. One is produced by the U. S. Public Health Service under the title "Save a Day." It gives a very comprehensive account of the activities of the Industrial Hygiene Division of the National Institute of Health. Examples of effective industrial control of dust and poisons, research in this field, and the work of plant dispensaries are among the subjects covered. The film is one reel in length and is available at reasonable prices in 16 and 35 mm. prints with sound. Write to the Federal Security Agency, U. S. Public Health Service, Washington, D. C. for further information. The second recommended film on industrial hygiene is entitled "We're On the Spot." From the standpoint of content, this is an outstanding presentation. The film emphasizes certain

practical safety precautions applicable to all industrial plants. Prints may be bought or rented from Vision Educational Productions, 509 Fifth Avenue, New York, N. Y. The film is available in 16 and 35 mm. prints, sound or silent versions. There is also a sound-slide version available in 35 mm. prints. . . . For an article on physical education that "makes sense" read "Physical Training in the Army Air Forces," by Major General Walter R. Weaver, in the March-April, 1942, issue of the *Air Forces News Letter*. . . . The Greater New York Safety Council, taking cognizance of "off-the-job" accidents, recently published the following "Victory Verse":

"Joe works hard at his milling machine  
Always on the alert—  
He crosses the street when the light is green—  
Knowing he won't be hurt.  
He keeps his home safe—and his family too—  
For Joe has a *Victory job* to do!"

## BOOKS AND REPORTS

**Memorable Days in Medicine. A Calendar of Biology and Medicine—** By Paul F. Clark and Alice Schiedt Clark. Madison: University of Wisconsin Press, 1942. 305 pp. Price, \$2.00.

This calendar furnishes a practical way of finding at a glance the dates of births and deaths of prominent physicians and of notable events in medicine. There are also included notes on many hospitals with the dates of their foundation, the names of the architects who built them, and some of the prominent names connected with them; types of medicine in the various countries of the world, a list of Saints who in one way or the other must be remembered in connection with the medical art, and a number of other interesting facts. There are sketches of some 469 physicians which include most of the great founders as well as some of the notorious quacks who flourished from time to time. These are necessarily short but tell why these men were great, and in many instances, interesting personal characteristics are given.

As far as possible the birth dates rather than those of the deaths are given, but there is difficulty in ascertaining some of these, even those of the most famous. The compilation has engaged the authors for a number of years and has served in part as a basis for exhibits on medical history and biography in the Memorial Room of the University of Wisconsin Medical School.

The selection of subjects is good, but presumably many readers will detect omissions which they regret. The authors have foreseen this and tell us they have omitted many of their own favorites. The cross-referencing is

fairly complete, though there are omissions which might leave the average reader with a false impression of actual priority of discoveries. A notable example of this concerns the discovery of ether anesthesia.

There is a good biography and an excellent index. The volume is a distinct addition to the study of medical history, to which too little time is given in practically every medical school, in spite of the fact that great leaders and teachers, like Welch and Victor Vaughan, have stressed its importance in medical education.

The printing and make-up are excellent. There are 29 illustrations, most of which are of persons. The book opens for January 1 with the Hippocratic Oath, which the authors offer as the best of all New Year's resolutions.

MAZÛCK P. RAVENEL

**Outlines of Food Technology—** By Harry W. von Loesecke. New York: Reinhold Publishing Corp., 1942. 505 pp., 84 ills. Price, \$7.00.

With the present interest in nutritional problems, it is fortunate to have a book dealing with food technology. This book will be very valuable to many nutrition workers since the information is given in rather complete but concise form. Practically all available foods and food products are discussed both from the point of view of production, and methods of handling before purchase by the consumer. Special chapters are devoted to storage and marketing of fruits and vegetables and preservation of foods by freezing.

No attempt is made to give the nutritive value of the different foods or the effect of processing on the degree of retention of the more important nu-

trients. Since the author had the advice of some of the leading authorities in food technology during the preparation of this book, the information can be accepted with confidence.

This book will be a very handy reference to public health workers.

C. A. ELVEHJEM

**Source Book of Medical History**  
—By Logan Clendening, M.D. New York: Hoeber, 1942. 685 pp. Price, \$10.00.

Dr. Logan Clendening has rendered a useful service in compiling a *Source Book of Medical History*. The compendium spans the time from 1900 B.C. to 1895 A.D.; from the Kahun Papyrus to Roentgen's contribution "On a New Kind of Ray."

The compiler's lot is never fully a happy one for try as he will he is bound to displease. He is naturally exposed to the critical challenge, "why this selection and not *that* other one?" and most readers of this work are likely to have unique ideas as to what *should* have gone into the collection.

This much, however, can be said for Dr. Clendening's compilation—that whatever may be its sins of omission—it is without those of commission. Every item given is worthy of inclusion. And especially noteworthy are the texts culled from non-medical literature which properly belong to medical history, items such as those drawn by the author from Aristophanes' "Plutus," Plato's "Phaedo," and from the writings of Molière, Thackeray, Dickens, and others.

The virtue in going back to the original sources is to gather a first hand appreciation of the men and the works that are the *Bausteine* of medical history. But few of the selections included in the Clendening book are given in their entirety. Hence, the question arises, "Can one envisage the block by its chips?" The compilation really

represents a double selection: first, as to what works, and second, as to what fragments thereof were to be published. The author palpably had to choose between including fewer "whole" examples, and giving a larger number of partial ones. He chose the latter. The end result is rather good. The work certainly offers a good and instructive sampling of the classics in medicine.

It can be read as a sketch book of medical history, for the chronological arrangement of the abstracts does offer one a rather loose and large outline of "progress in medicine."

Each chapter is preceded by a brief discussion of the period dealt with, and a good reference list is provided for each period.

IAGO GALDSTON

**Health in Schools—Twentieth Yearbook: Includes Report of the Executive Secretary and List of Members. American Association of School Administrators: 1201 Sixteenth Street, Washington, D. C., 1942. 544 pp. Price, \$2.00.**

This is the Report of 1942 of the Commission on Health in Schools representing the American Association of School Administrators. It starts by discussing the Organization and Administration of the General Program and the Guidance of Individual Pupil Health. The chapter on Guidance is largely a presentation of procedures in school health services.

These general chapters are followed by discussions of health instruction, physical education and recreation, mental hygiene, special programs for the physically exceptional, the control of communicable disease, emergencies and their treatment, the type of environment needed to make possible a healthful school, the functions and preparation of school health personnel, as well as administrative practices, coördination of health agencies, and the legal aspects of this intensively specialized program.

The value of the report is greatly enhanced by a bibliography divided by chapters. A section on methods of appraisal of the program, in which various types of tests and measurements are discussed, gives great aid to the school or health administrator who really wishes to know the status and progress of the various activities involved. School health programs fail largely from lack of information as to the program, as to what other schools are accomplishing, and as to the improvements and checks that are possible.

Since this text will go into the hands of a great majority of our school administrators, it should have great influence for good on their thinking and procedures.

C. H. KEENE

**Rabies**—By Leslie T. Webster, M.D. New York: Macmillan, 1942. 168 pp. Price, \$1.75.

This book contains less than one hundred pages of reading matter and fifty or more pages of sketches or graphs, tables, references, and appendices.

The author recognizes that a simple, critical, and fairly inclusive treatise on rabies should be available to all and with this in mind directs chief interest toward giving the best answers of the day to practical questions. The subject matter is focused on two chief problems and accordingly the text is prepared in two parts, diagnosis and prevention.

The book does not furnish a solution to all questions pertaining to rabies but is a clear, concise, and accurate assemblage of the essential information and brings the subject up to date. It consists mostly of facts and does not theorize to any extent. One who reads its contents will gain thereby and will not be left in darkness on the subject.

From the standpoint of diagnosis in suspected animals, and of prevention of human cases by vaccination, the mouse test which was developed by the author is recommended as a measuring tool, to

be used as a means of final decision in the diagnosis and as a quantitative measure of potency of vaccines.

The author gives a brief critical but fair review and analysis of controlled experiments on vaccination, showing inconsistency of results, the necessity of controlled field experiments, the lack of evidence that the use of vaccine after exposure offers any protection, recommends that persons exposed should have treatment only with vaccines proved potent and outlines a procedure to be followed in exposed persons. He discusses the probability of a difference in strains of virus but apparently overlooked differences indicated by some of the controlled experiments.

The second chapter "Is Rabies a Myth?" does not seem to fit into the sequence of the descriptive text and might better not have been included in the book or, with the last paragraph omitted, could have been included in the first chapter. Also there might be some difference of opinion as to whether the term "myth" is properly used in this sense, and if so some substantive reasons for the question should have been given.

The book contains much good sense and a lot of practical knowledge which should be available for ready reference to students, researchers, physicians, veterinarians, and other interested persons, especially those having some knowledge of the disease.

M. F. BARNES

**Family Nutrition**—By Rachel M. Winlock, Emerson R. Sausser, Joseph Stokes, James J. Waygood, Anna de Planter Bowes, Pauline Berry Mack. Published by the Philadelphia Child Health Society, 1942. 106 pp. Free.

A committee of six medical and nutrition scientists has written a compact, authoritative, easily read, well illustrated monograph on "Family Nutrition." Its popular style adapts it to

the use of lay groups. Its complete bibliography is valuable for the person who may wish to read original sources.

The following chapter titles: Nutrition and the Nation's Fitness, the Nutritional Status of Human Beings, How Nutritional Status in Human Beings Is Measured, The Dietary Value of Common Foods. The Nutritional Needs of People, The Relationship of Food Intake and of Appetite to Nutritional Status and to Resistance to Disease, Balanced Diets and Balanced Budgets, are self-explanatory as to content.

Chapters II and III give suggestions and references which might be helpful in planning large scale mass studies using human subjects. To the reviewer this seems particularly useful at this time when communities need to learn more about the nutrition status of their own families.

The monograph is offered for free distribution in the interest of National Defense. Its publication was made possible by a Grant-in-Aid from the Beneficial Industrial Loan Corporation. Those teaching nutrition in a community program, in formal school classes, and others, may obtain single copies while the supply lasts by writing to the Philadelphia Child Health Society, 311 South Juniper Street, Philadelphia, Pa.

AGNES ENGLISH VAUGHN .

**The People Against Tuberculosis—The Story of the Christmas Seal—**

*By Leigh Mitchell Hodges. New York: National Tuberculosis Association, 1942. 54 pp. Price, \$1.00.*

From an acorn to a sturdy oak in thirty-five years may well epitomize this fascinating story of a simple idea. The value of the tale is enhanced by the fact that the author was one of the planters of the acorn and has witnessed its growth to dimensions far beyond his fondest dreams. While the idea originated in foreign soil—Denmark—it was in the United States of America

where the soil, climate, and conditions made for its maximum development.

The Christmas Seal has been the tie which has bound together the complex organization of social forces which we today call the "tuberculosis movement." Mr. Hodges reveals dramatically how the germination of the idea was beset with all but disastrous difficulties. He gives due credit to Einar Holboell of Denmark for the idea of the Christmas Seal and Miss Emily Bissell of Wilmington, Delaware, for the adaptation of the idea in this country. Woven into the story of the Seal is the scientific side of tuberculosis work.

Throughout the account, one is impressed with the basic factors which go to make a successful social effort—a need to be met; a program for meeting that need; the translation of that program into a working organization; the adequate financing of the organization and intelligent leadership. In short the story of the Christmas Seal is also the story of the other factors in the successful combat of the scourge of society.

The little volume is well printed, adequately illustrated, and dramatically, though truthfully, written. Its publication served to mark the fiftieth anniversary of the founding of the first voluntary organization in the world—The Pennsylvania Society for the Prevention of Tuberculosis in 1892.

ROBERT G. PATERSON

**Preventive Medicine in Modern Practice—Edited Under the Auspices of the Committee on Public Health Relations of the New York Academy of Medicine. New York: Hoeber, 1942. 851 pp. Price, \$10.00.**

Here is a book the like of which has long been awaited by the medical profession, and although medical students are unaware of the fact they too have badly needed such a volume. *Preventive Medicine in Modern Practice* is essentially what the title implies: a

discussion of the problems of preventive medicine which are encountered by the physician in his daily practice and, in so far as possible, the presentation of solutions of these problems.

The range of subjects covered in this volume is comprehensive: socio-biological aspects of preventive medicine, 56 pages; clinical aspects, 565 pages; environmental aspects, 109 pages; organizational aspects, 93 pages. This seems a sound proportional allotment of space to these respective major divisions, particularly so when one considers that this volume is designed for the practitioner and student rather than for the public health officer. But even for the latter, especially in fields from which he has permitted his routine work to withdraw him, there is here presented a great body of factual information and to no small extent a reorientation.

Aside from the value of this book as a book, the fact that it has been published by the New York Academy of Medicine is of unusual significance. The Academy is one of the great professional organizations of the United States. It has acquired a reputation for sanity, realism, and courage. While it observes a safe conservatism, it is not unwilling, if the occasion arises, to face and consider and, if indicated, to act favorably upon any pertinent medical problem, even though the consideration and action be outside the realm of convention and tradition. That such an organization has published this volume not only gives assurance of the book's soundness, but indicates the Academy's conviction that preventive medicine presents to the practitioner both an opportunity and an obligation.

The volume is not the product of any one author, but represents the joint effort of a number of authorities, carefully selected because of competence in their respective fields. Always, of course, a volume so produced, while strong in exactness and detail, carries

with it the danger of non-continuity and spottiness. In this instance lack of uniformity and unity are satisfyingly offset by what must have been a very hard working editorial committee of physicians eminently suited to the task. Incidentally, the preface lays down a fine philosophy.

H. S. MUSTARD

*Civil Defense Measures for the Protection of Children: Report of Observations in Great Britain, February, 1941—By Martha M. Eliot, M.D. Washington, D. C.: Children's Bureau, 1942. 186 pp. Price, \$30.*

No one interested officially or otherwise in the health and welfare of mothers and children can well afford to miss Dr. Eliot's report on her studies made in Great Britain as a member of the United States Civil Defense Mission which was sent to that country early in 1941. Since Pearl Harbor, the protection of children under bombing, the effect of war on children, and the many problems incident to evacuation from target areas are matters that have taken on an urgent significance for Americans.

Dr. Eliot of all persons was the one to set forth for us the details of the British experience and the lessons to be learned. It may be that some of the medical and social unpreparedness in cities and rural areas will be corrected on this side of the Atlantic by the time we are bombed. But as a preliminary to correcting this situation we shall have to give up a part of our smug complacency promptly.

With all the blueprinting that this report makes possible for us, we will do well if we can approach the success of our British friends in child care under bombing. The long range planning and training is described and then the first Major Evacuation from city to country during the four days, September 1-4,

1939. A total of 607,635 adults and children were removed from London to rural areas without a casualty. There were roughly 350,000 school children with their teachers, and 230,000 mothers with children under 5 years old. The others were expectant mothers and the handicapped and the blind.

The early chaos due in part to the lack of trained social workers in the reception areas and the inability to fit particular children into rural household billets on a selective basis resulted in a trek back to the city. This trek, of course, was also due to the failure of the bombing to begin. The second general evacuation from London and other cities in September, 1940, found better medical inspection services to control pediculosis, scabies, and impetigo. Enuresis was also an outstanding worry. Dr. Eliot's description of the ingenuity of official and voluntary agencies (The Women's Voluntary Services—W.V.S.—particularly) working closely together to meet the unexpected makes her well documented report indeed a fascinating one to read.

HUNTINGTON WILLIAMS

*Nursing: An Art and a Science—By Margaret A. Tracy. (2nd ed.) St. Louis: Mosby, 1942. 754 pp. Price, \$3.50.*

*Nursing, An Art and a Science* has been revised to make it more useful as a textbook for student nurses. It is divided into three parts: General Considerations, Diagnostic Procedures, and Therapeutic Procedures. Supplementary to the text is a list of commonly used nursing procedures. In the preface to the second edition the author states, "Wholly new is the chapter concerned with hospital housekeeping . . ." "The chapter on charting has been greatly expanded."

This book, written primarily as a text for student nurses, is excellently planned and organized. The subject is

simply and logically presented, and can be followed readily by the student. An attractive feature is the use of 183 well selected illustrations. The nurse is given recognition as a health teacher, and opportunities are planned for her to integrate her teaching while rendering regular daily duties. This is an excellent procedure.

Although the second edition of this book is an improvement on the one previously published, the inclusion of nursing procedures is questionable. The author acknowledges the procedures are used in the University of California Hospital and cannot be adopted wholly by any other institution. The printing of them covers 162 pages. The book is heavy and unwieldy.

The volume seems well adapted for the purposes for which it was intended. It is recommended for use in schools of nursing and as a reference book for public health nurses.

FRANCES F. HAGAR

*Manual for the Conduct of Classes for Expectant Parents—By Ellen D. Nicely, et al. (2nd ed. rev.) (1001 Huron Road) Cleveland: Child Health Association, 1942. 167 pp. Price, \$1.50.*

The fact that the Cleveland Child Health Association, under Dr. Richard Bolt's leadership, has been able to maintain such successful classes for expectant parents on a community-wide basis for both well-to-do patients and for low income groups has long caused comment. It is therefore helpful to have a detailed account, lesson by lesson, of the material that is presented in these classes. The new manual is helpful in that it also gives samples of publicity folders, admission card, etc., in the classes. The material will be useful to anyone who is faced with the problem of developing educational work for expectant parents.

LEONA BAUMGARTNER

**Personality and Mental Illness: An Essay in Psychiatric Diagnosis**—By John Bowlby, M.D. New York: Emerson Books, Inc., 1942. 280 pp. Price, \$2.75.

This book represents a serious attempt to bring about a greatly needed new orientation in an old subject. To this end, the author who is Psychiatrist at the London Child Guidance Clinic, and Physician to the London Clinic of Psychoanalysis, has made his approach to the problems of mental disease by evaluating basic personality traits rather than the surface symptoms of mental disorder.

A discussion of the work on personality types and their relations to neuroses and psychoses done in the past including modes of psychiatric classification proposed by Kraepelin, Bleuler, Adolf Meyer, Kretschmer, Kahn and others introduces the various aspects of this complicated field of scientific investigation. This is followed by a schedule of personality traits characteristic of the major types of personality, with emphasis on the schizoid and syntonetic varieties, which will be useful in distinguishing them, and a practical clinical method of measuring and describing personality forms. Tabulations of these traits for 36 patients who have had a psychosis and for 29 patients suffering from neurotic symptoms are presented, with descriptions of typical unstable personalities. Thirty-three traits are selected as being particularly significant for diagnostic purposes.

The section of the book devoted to the psychoneuroses contains many worth while suggestions for diagnosis and regrouping of the forms, in a classification scheme that has some clinical advantages. As the author himself states, a great deal of the subject is still

in stages of research. Throughout the text a number of attractive research leads are offered in the field of psychopathology where original work is becoming more and more urgent.

Although many of the conclusions are tentative in character, the ideas presented and the method of study proposed make the book a valuable contribution to the literature on psychiatry, and students of this subject will find much of interest in its pages.

NOLAN D. C. LEWIS

**Our Sex Life**—By Fritz Kahn, M.D. (2d ed.) New York: Knopf, 1942. 459 pp. Translated from the German by George Rosen, M.D. Price, \$5.75.

This book is written for everyone, but it is doubtful if everyone would profit by its perusal. It covers a wide and problematical field of information. One could question whether its general reading would be very helpful. It tries to cover sex from physiology to pathology.

Many statements are either inaccurate or not proved. Though some of these inaccuracies are not very important, they do tend to discredit the author as an authority.

The subject seems to be approached more from the standpoint of the individual than of society. It is questionable if the cumulative experience of mankind in developing civilization can be ignored regarding sex as well as other important matters. One might suggest that civilizations which have become engrossed in the various pleasures of living have either fallen or deteriorated and failed to progress.

The author, recognizing the biologic importance of sex, seems to stress the development of the sexual drive rather than the fundamental biologic purpose of sex.

FRED L. ADAIR



## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**Captain of the Illnesses**—Standing first among the disabling diseases, arthritis cannot be ignored by any health worker, however little he may be able to do about it. So this primer, prepared by an outstanding committee, becomes an indispensable addition to our professional libraries.

AXON. Primer on Arthritis. J.A.M.A. 119, 14:1089 (Aug. 1), 1942.

**Health in Schools**—Ten considerations in formulating any school health program are set forth to open a symposium: a measured viewpoint, based upon ascertainable fact, keeping within bounds of scientific knowledge, and attainable goals, avoiding outworn traditions, seeking quality rather than quantity of service, providing follow-up, utilizing all professional services, always respecting the chief objectives of schooling, and coördinating with community services—these are the ten.

BAUER, W. W. School Health and the Nation's Health (and two related papers). New York State J. Med. 42, 15:1454 (Aug. 1), 1942.

**Soldier's and Sailor's Shots**—Just in case someone asks you: smallpox vaccine, typhoid vaccine (with paratyphoid A and B added, again), and tetanus toxoid are given to all military personnel. Yellow fever vaccine, originally administered to all, now is to be given only to those about to depart for areas where the disease is endemic. Cholera and plague vaccines are also ready for troops and naval forces who are to be sent to countries where they may be exposed to these diseases. Typhus vaccine is under study.

ENDERS, J. F. The Present Program for the Immunization of Military Personnel.

New Eng. J. Med. 227, 5:162 (July 30), 1942.

**More Praise for Sister Kenny's Method**—In this Canadian symposium on poliomyelitis and encephalitis, there are eleven papers on the epidemiology, diagnosis, pathology, and treatment (including the Kenny Method) of poliomyelitis and three on encephalitis. There is so much here that this note can do no more than to call your attention to the existence of the mine of information.

JACKSON, F. W., *et al.* Poliomyelitis and Encephalitis. Manitoba, 1941. Canad. Pub. Health J. 33, 6:242 (June), 1942.

**Deficiency States, Clinical and Subclinical**—Some clinicians, who recognize only the frank manifestations, insist that deficiency diseases are rare. But researchers who have conducted extensive surveys know that deficiency states are widely prevalent. The author discusses some solutions for this seeming impasse. Incidentally, he points out that some changes previously thought to be attributable to the aging process are manifestations of dietary deficiencies.

KRUSE, H. D. A Concept of the Deficiency States. Milbank Quart. 22, 3:245 (July), 1942.

**Plumbism**—Through its laboratory service, a local health department was able to study the incidence of lead poisoning in its city. Three out of five cases were among children (from chewing lead-painted toys). The adult cases were mostly of industrial origin.

MCDONALD, J. M., and KAPLAN, E. Incidence of Lead Poisoning in the City of Baltimore. J.A.M.A. 119, 11:870 (July 11), 1942.

**Health Under Nazi Rule**—Though we know little of current conditions in Paris, the author of this paper brought with him, when he left near the end of 1941, some suggestive statistics. Tuberculosis increased during the first year of food restrictions, and mortality was highest in the most neglected age group—the old people. It is reasonable to assume that conditions are much worse now.

MINOLI, R. F. Food Rationing and Mortality in Paris, 1940–1941. *Milbank Quart.* 20, 3:213 (July), 1942.

**Help!**—A thousand-plus health departments answering a questionnaire report that they employ full-time more than 17,000 technically trained persons, have existing vacancies for another 1,000, and need still another 4,000 to take care of wartime activities. Hospitals are short-handed too.

PERROTT, G. ST. J., and DORN, H. F. Current Needs for Health Personnel. *Pub. Health Rep.* 57, 27:997 (July 3), 1942.

**Sex and Sickness**—Women are more frequently ill than men, but mortality rates are higher among the males. The authors looked into this seeming paradox of sex differences in ill health. Though the weaker sex undoubtedly enjoys more illnesses, the laughingly called stronger sex is hit harder when sick. You'll want to see the statistics.

PREAS, S., and PHILLIPS, R. The Severity of Illness among Males and Females. *Milbank Quart.* 22, 3:221 (July), 1942.

**Wartime Nursing Adjustments**—Nurses by thousands are needed by the Army and Navy. The reduced nursing personnel that remains at home must be utilized most effectively to cover the greatly increased need for nursing in factories, clinics, health agencies. The job of making necessary adjustments, selecting trained personnel and trainees, and planning community services is a large order. All of us should know how it is being done, and this paper tells us.

SHEATHAN, M. W. Public Health Nursing in the War. *Pub. Health Nurs.* 34, 7:371 (July), 1942.

**Needless Worries Department**—There is no need for fear that we shall have insufficient or inadequate food supplies for ourselves, and to meet the "fillable" needs of our allies in 1942 or the years that lie ahead, concludes this nutritionist-economist.

WELLS, O. V. Can We Produce Enough Food? *Pub. Health Nurs.* 34, 7:361 (July), 1942.

**"Victory—the Only Plank"**—“The professional, long operating at the will of the people, long granted special privileges by the people, tends to forget the source or the purpose of that privilege.” Addressed to sanitary engineers, this admonition may well be taken to heart by all of us, in these days when our country has but one purpose.

WOLMAN, A. A Platform for the A.W.W.A. in the Coming Year. *J. Am. Waterworks Assn.* 34, 7:979 (July), 1942.

## BOOKS RECEIVED

- AMBASSADORS IN WHITE: STORY OF AMERICAN TROPICAL MEDICINE.** By Charles Morrow Wilson. New York: Holt, 1942. 372 pp. Price, \$3.50.
- PHYSIOLOGICAL HYGIENE.** By Cleveland Pendleton Hickman. rev. ed. New York: Prentice-Hall, 1942. 482 pp. Price, \$3.25.
- BACTERIOLOGY.** By Einar Leifson. New York: Hoeber, 1942. 526 pp. Price, \$5.00.
- OCCUPATIONAL TUMORS AND ALLIED DISEASES.** By W. C. Hueper. Springfield, Ill.: Thomas, 1942. 896 pp. Price, \$8.00.
- STEDMAN'S PRACTICAL MEDICAL DICTIONARY.** By Stanley Thomas Garber. 15th ed. Baltimore: Williams & Wilkins, 1942. 1257 pp. Price, \$7.00; Thumb Indexed \$7.50.
- THE MENTAL GROWTH OF CHILDREN FROM TWO TO FOURTEEN YEARS.** By Florence L. Goodenough and Katherine M. Maurer. Minneapolis: University of Minnesota Press, 1942. 130 pp. Price, \$2.50.
- HOUSING YEARBOOK 1942.** Coleman Woodbury and Edmond H. Hoben, Editors. Chicago: National Association of Housing Officials. 1942. 192 pp. Price, \$3.00.
- AMERICAN RED CROSS HOME NURSING.** By Lona L. Trott. Philadelphia: Blakiston, 1942. 429 pp. Price, \$60.
- THE BIOLOGICAL ACTION OF THE VITAMINS.** E. A. Evans, Editor. Chicago: University of Chicago Press, 1942. 277 pp. Price, \$3.00.
- PSYCHOTHERAPY IN MEDICAL PRACTICE.** By Maurice Levine. New York: Macmillan, 1942. 320 pp. Price, \$3.50.
- TUBERCULOSIS SANATORIUM DIRECTORY 1942.** Compiled by the National Tuberculosis Association, New York. 1942. 185 pp. Price, \$1.50.
- STANDARD NOMENCLATURE OF DISEASE AND STANDARD NOMENCLATURE OF OPERATIONS.** Edwin P. Jordan, Editor. Chicago: American Medical Association, 1942. 1,022 pp. Price, \$4.00.
- DIGEST OF LAWS DEALING WITH PROSTITUTION AND OTHER SEX OFFENSES.** By George Gould and Roy E. Dickerson, Editors. New York: American Social Hygiene Association, 1942. 453 pp. Price, \$5.00.
- THE NATIONAL FORMULARY.** 7th ed. Prepared by the Committee on National Formulary of the American Pharmaceutical Association, 1942. Washington: American Pharmaceutical Association, 1942. 690 pp. Price, \$6.00.
- TEACHING ATHLETIC SKILLS IN PHYSICAL EDUCATION.** By Henry C. Craine. New York: Inor Publishing Co., 1942. 236 pp. Price, \$2.75.
- COLLECTED REPRINTS OF THE GRANTEES OF THE NATIONAL FOUNDATION FOR INFANTILE PARALYSIS.** 1941. Vol. II. New York: National Foundation for Infantile Paralysis, 1942.
- NUTRITION AND CHEMICAL GROWTH IN CHILDHOOD.** Vol. I, Evaluation. By Icie G. Macy. Springfield, Ill.: Thomas, 1942. 432 pp. Price, \$5.00.
- A SURVEY OF MUNICIPAL AND STATE MEAT INSPECTION.** By Bert W. Bierer. Mimeographed supply limited. Published by Author, Box 83, Camden, Del. Price, \$5.00.
- A LIST OF SOURCE MATERIALS FOR TEACHERS OF COLLEGE HYGIENE.** Compiled by the American Student Health Association. New York: Metropolitan Life Insurance Co., 1942. 46 pp.
- OUT-PATIENT CARE FOR THE NEEDY.** By Joint Committee of the American Hospital Association and the American Public Welfare Association, Chicago, Ill. 1942. 16 pp.
- HEALTH CONDITIONS IN NEW YORK CITY:** By Health Center Districts and Boroughs, Five Years From 1936 to 1940. New York: New York Tuberculosis and Health Association, 1942. 30 pp.
- INDUSTRIAL FATIGUE.** By Meyer Brown. Chicago: Zurich General Accident and Liability Ins. Co., Ltd., American Guarantee and Liability Insurance Co., 1942. 18 pp.
- AN ANNOTATED BIBLIOGRAPHY ON THE SANITATION OF EATING PLACES.** New York: The Public Health Committee of the Cup and Container Institute, 1942. 15 pp.
- DIRECTORY OF VENEREAL DISEASE CLINICS,** 1942. Washington: United States Public Health Service. 136 pp.
- A BRAND NEW BABY.** By Margaret A. Stanger. Boston: The Beacon Press, 1942. 132 pp. Price, \$1.75.

# ASSOCIATION NEWS

## SEVENTY-FIRST ANNUAL MEETING ST. LOUIS, MO., OCTOBER 27-30, 1942

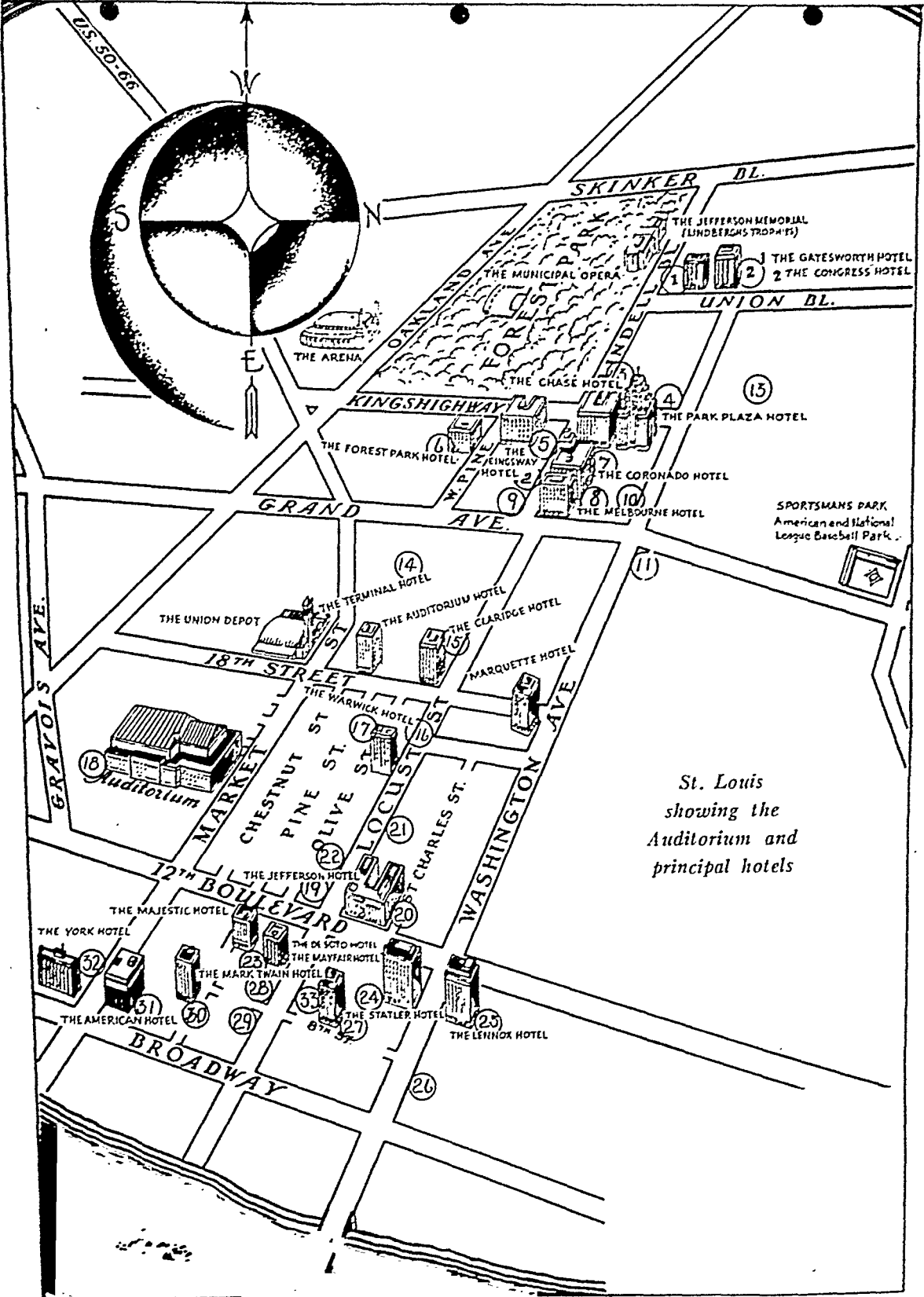
*Meeting Headquarters: Municipal Auditorium*

*Residence Headquarters: Hotels Jefferson and Statler*

### RAILROAD FARES FROM VARIOUS POINTS TO ST. LOUIS, MO.

#### *American Public Health Association October 27-30, 1942*

<i>From</i>	<i>One-way for Pullman Travel</i>	<i>Round-trip for Pullman Travel</i>	<i>One-way Lower Berth</i>	<i>One-way Upper Berth</i>
Atlanta, Ga.	\$20.80	\$31.20	\$5.25	4.00
Baltimore, Md.	29.65	53.55	6.95	4.80
Boston, Mass.	40.10	72.20	9.25	6.40
Buffalo, N. Y.	23.70	43.80	5.80	4.40
Chicago, Ill.	9.65	14.45	2.95	2.20
Cleveland, Ohio	17.60	33.20	4.35	3.30
Dallas, Tex.	22.00	33.05	6.40	4.90
Denver, Colo.	30.05	45.10	7.90	5.95
Duluth, Minn.	23.95	35.95	6.40	4.90
Fort. Worth, Tex.	22.45	33.65	6.40	4.90
Indianapolis, Ind.	8.20	16.05	2.95	2.00
Jacksonville, Fla.	31.10	46.65	8.10	6.20
Kansas City, Mo.	9.20	13.80	2.95	2.20
Louisville, Ky.	9.40	14.10	2.95	2.00
Los Angeles, Calif.	67.10	94.15	17.35	13.20
Memphis, Tenn.	10.25	15.40	2.95	2.20
Milwaukee, Wis.	12.45	18.65	3.50	2.65
Minneapolis, Minn.	19.30	28.95	4.35	3.30
Nashville, Tenn.	11.20	16.80	2.95	2.20
New Orleans, La.	25.60	38.45	6.80	5.15
New York, N. Y.	34.85	62.80	8.45	5.80
Omaha, Nebr.	13.85	20.80	3.50	2.65
Philadelphia, Pa.	31.90	57.40	7.85	5.40
Pittsburgh, Pa.	20.40	38.10	4.95	3.45
Portland, Ore.	72.10	94.15	17.35	13.20
Salt Lake City, Utah	46.30	64.70	11.90	9.05
San Francisco, Calif.	67.10	94.15	17.35	13.20
Seattle, Wash.	72.95	94.15	17.35	13.20
Washington, D. C.	29.65	53.55	6.95	4.80
Montreal, Que.	37.55	67.05	9.25	6.40
Halifax, N. S.	65.20	91.60	17.35	13.20
Ottawa, Ont.	34.25	61.60	8.45	5.80
Quebec, P. Q.	43.80	78.20	9.25	6.40
Toronto, Ont.	24.90	44.30	5.80	4.40
Vancouver, B. C.	72.95	94.15	17.35	13.20



St. Louis  
showing the  
Auditorium and  
principal hotels

American Hotel	31	Gatesworth Hotel	1	St. Louis University	9
Bishop Tuttle Memorial	19	Jefferson Hotel	20	Scruggs-Vandervoort-Barney	28
Board of Education	33	Kingsway Hotel	5	Sheldon Memorial	10
Chase Hotel	3	Lennox Hotel	25	Statler Hotel	24
Claridge Hotel	15	Mark Twain Hotel	30	Stix, Baer & Fuller	26
Congress Hotel	2	Mayfair Hotel	27	Third Baptist Church	11
Coronado Hotel	7	Melbourne Hotel	8	Vashon High School (Negro)	14
DeSoto Hotel	23	Municipal Auditorium	18	Warwick Hotel	17
Elks Club	12	Park Plaza Hotel	4	Y.M.C.A.	16
Famous-Barr	29	Public Library	22	York Hotel	32
Forest Park Hotel	6	Roosevelt Hotel	13	Y.W.C.A.	21

RATES QUOTED BY ST. LOUIS HOTELS

Seventy-First Annual Meeting, October 27 to 30, 1942

AMERICAN PUBLIC HEALTH ASSOCIATION

ALL RATES QUOTED ARE FOR ROOMS WITH BATH  
ON EUROPEAN PLAN

Hotel	Single	Double	Suites
New Hotel Jefferson	\$3.00-5.00-6.00-7.00	\$6.00-7.00-7.50-8.00	\$12.00-20.00
Statler	3.00-3.50-3.75-4.00	5.25-6.00-6.25-6.50	17.00-18.00
	4.25-4.75-5.00	6.75-7.00-9.00	
American	2.00-2.50	3.50-4.00	
Claridge	2.50-3.00	3.50-7.00	
Coronado	2.25 (shower)	4.50-5.00	6.00
	2.75		
DeSoto	2.65-up	4.00-5.00	8.00
Lennox	3.50-4.00-4.50-5.00	4.50-5.00-6.00-7.00	10.50-14.50
	6.00	8.00	
Mark Twain	2.50-4.00	3.50-5.00-5.50	
Maryland	2.25-2.50-2.75	3.25-3.50-3.75-4.00	
		4.50	
(without bath)	1.75-2.00	2.75-3.00	
Mayfair	3.00-3.50-4.00-5.00	4.00-4.50-5.50-6.00	
		7.00	
Melbourne	2.65-3.20-3.70-4.20	4.20-4.80-5.30-5.80	
		6.20	
Park Plaza	4.50	6.00-8.00	12.00-18.00
Warwick	2.00-2.50-3.00	3.00-3.50-4.00-4.50	7.00-10.00
		5.00	

.....(Cut off on this line and mail to the hotel of your choice).....

HOTEL RESERVATION BLANK FOR THE ST. LOUIS MEETING  
AMERICAN PUBLIC HEALTH ASSOCIATION, OCTOBER 27-30, 1942

To .....  
(Name of Hotel)

Please reserve for me ..... rooms for ..... persons  
for the A.P.H.A. Meeting.

Single room ..... Double room .....

Maximum rate per day for room \$..... Minimum rate per day for room \$.....

I expect to arrive ..... If date of arrival is changed I will notify  
you at least 24 hours in advance.

Please acknowledge this reservation.

Name .....

Street Address.....

City..... State.....

THE ST. LOUIS ANNUAL MEETING,  
OCTOBER 27-30

THE program of the Association's Wartime Conference on Public Health was published in the August issue. Elsewhere in that issue, specifically on page 847, the membership was assured that plans for the 71st Annual Meeting were proceeding as scheduled and that there was every reason to believe they would be carried through. It was pointed out that professional public health workers need to come together, as England has discovered, not in spite of the emergency, but because of it, in order that new information and experiences may be shared for the benefit of the nation. The health protection of the civilian population, to which we as a profession are dedicated, and the health protection of the armed forces, in which many Association members are now engaged as individuals, are essential to the successful prosecution of the war. Attendance at St. Louis will help us fight the war better.

Since the August *Journal* went to press, Surgeon General Parran has agreed to preside at the General Session on "War and the Health Department," on Wednesday morning, October 28. Hon. Charles P. Taft has been invited by the Program Committee to speak from the national standpoint; Dr. Wilton L. Halverson, Los Angeles County, will speak as the Health Officer of a western county and Dr. Alfred Burgdorf, Hartford, Conn., as the Health Officer of an eastern city.

Word has come that three distinguished representatives of Great Britain will be present, in addition to the Hon. Malcolm MacDonald, High Commissioner for Canada, whose attendance was announced previously. Sir John Orr, eminent nutritionist, will speak at a luncheon in his honor sponsored by the Food and Nutrition Section, on

Tuesday, October 27. Professor W. M. Frazer, Medical Officer of Health of the City and Port of Liverpool, Medical Officer to the Liverpool Education Authority and Professor of Hygiene at the University of Liverpool, will address the Health Officers Section. Dr. E. R. A. Merewether, representing the Ministry of Labour, factory medical inspector, and Lecturer on Industrial Hygiene at Aberdeen University, will be featured on the Industrial Hygiene Section program. Canada is sending a number of program participants as well as numerous delegates, and several of the Latin American republics will be represented..

Three conferences not described in the preliminary program have been definitely scheduled. One is a conference on Orthopedic Nursing, sponsored by the Joint Orthopedic Nursing Advisory Service, to be held on Saturday, October 24, and Sunday, October 25. It is planned primarily for nurses actively engaged in crippled children's services. Registration is limited to thirty, and will close October 1. Applications should be addressed to Jessie L. Stevenson, R.N., Joint Orthopedic Nursing Advisory Service, 1790 Broadway, New York, N. Y.

Another is a Conference of Directors of Local Health Service, for which arrangements are being made by Dr. Ben F. Wyman, Director of the Division of Rural Sanitation and County Health Work of the South Carolina State Board of Health. Very successful conferences under the same auspices were held last year at Atlantic City.

The third is new, and noteworthy not because of that alone, but because it is the culmination of a desire of several years' standing on the part of those who teach Preventive Medicine

and Public Health to undergraduate medical students to meet for purposes of acquaintanceship and discussion of mutual problems. A meeting of these "Associated Teachers of Preventive Medicine" will be held on Friday, October 30, at 9:30 A.M. Wilson G. Smillie, Professor of Public Health and Preventive Medicine, Cornell University Medical School, will preside. Dr. Leland W. Parr of the George Washington University Medical School, Washington, D. C., is acting as Secretary for the group and will be glad to receive suggestions for the meeting, which is being set up as an informal discussion of the problems of contemporary importance in this field of medical education.

Certain programs intentionally incomplete a month ago are being rounded out in tune with the times, among them the sessions of the Ninth Institute on Public Health Education. This has been printed in full as a sepa-

rate and is available on request to the Central Office.

Reprints of the Preliminary Program from the August *Journal* will be supplied to anyone who wishes to send them to colleagues who have not access to the magazine.

The Chairman of the St. Louis Local Committee, Dr. Joseph F. Bredeck, announces that local affairs are in good order and that every effort will be made by him and his coworkers to fill the brief intervals between scientific sessions with visits to St. Louis institutions where inspiration and new ideas may be secured.

Reservations at the headquarters hotels, the New Jefferson and the Statler, should be made well in advance of the meeting, as should train reservations. Transportation is an important factor, and we can help the railroads, and assure our accommodations by reserving space and buying tickets early.

## APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

### *Health Officers Section*

E. J. Beckner, M.D., 106 East Second, Pratt, Kans., Director, Pratt County Public Health Unit

Leo Bernstein, M.D., M.P.H., Board of Health, Lihue, Kauai, T. H., Health Officer, Territorial Board of Health

John S. Coughlan, M.D., County Health Officer, Berkeley Springs, W. Va.

George R. Good, M.D., M.P.H., 1216 14th Ave., Altoona, Pa., District Medical Director, State Dept. of Health.

Oscar Harvey, M.D., 3200 W. Douglas, Wichita, Kans., Asst. Health Officer, Sedgwick County Health Dept.

Harvey B. Henry, M.D., 802 Norwood Bldg., Austin, Tex., City Health Officer, Luling, Tex.

Lester J. Kantor, M.D., D.P.H., Sells Indian Agency, Sells, Ariz., Senior Physician, U. S. Indian Service

Everett A. King, M.D., Tri-county Health Unit, Hardinsburg, Ky., Director

Elias W. Langa, M.D., Fairfax County Health Dept., Fairfax, Va., Asst. Health Officer, Northern Health Dist.

S. J. Maydet, M.D., 216½ E. Monroe, Springfield, Ill., District Health Supt., State Dept. of Health

William Pratt Scarlett, M.D., M.S.P.H., 205 Brown St., Morrilton, Ark., Director, Field Experience Center, State Board of Health

Harry F. Smith, M.D., Klamath Agency Hospital, Klamath Agency, Ore., Health Officer, U. S. Indian Service

Jules R. Thebaud, M.D., Service National d'Hygiene, Palais des Ministeres, Port au Prince, Haiti, Director General

### *Laboratory Section*

William A. Boyles, M.S., State Board of Health, Jacksonville, Fla., Assoc. Bacteriologist, U. S. Public Health Service

L. Amy Darter, 125 Panoramic Way, Berkeley, Calif., Supervising Bacteriologist, State Bacteriological Laboratory



Frederick W. Hindley, Health Dept., City Hall, Newport, R. I., City Bacteriologist  
 Katherine Kesling, M.S., 4003 McCorkle Ave., Apt. 201, Charleston, W. Va., Junior Diagnostic Bacteriologist, State Hygienic Laboratory

Nathan C. Kirsch, M.S., 268 Hale, New Brunswick, N. J., Asst. to Head of Sterile Production Laboratories, Schering Corp.

George W. Malaney, 2029 Cleveland Ave., S., Canton, Ohio, Asst. Scientific Aide, U. S. Public Health Service

#### *Vital Statistics Section*

Myron S. Heidingsfield, A.M., Ph.D., College of William & Mary, Williamsburg, Va., Asst. Professor of Statistics

#### *Engineering Section*

Lieut. A. Harry Bliss, 1104 West 8th St., Santa Ana, Calif., Army Air Force Sanitary Corps

Corp. Charles S. Laubly, Station Hospital, Tyndall Field, Fla., Medical Corps, U. S. Army

#### *Industrial Hygiene Section*

August Baier, M.D., 1158 Chautauqua Pk., Des Moines, Iowa, Medical Director, U. S. Rubber Co.

Francis R. Holden, M.A., Ph.D., 835 Fifth St., Oakmont, Pa., Industrial Hygienist, Industrial Hygiene Foundation

Watson F. Rogers, M.D., American Viscose Corp., Parkersburg, W. Va., Industrial Physician

#### *Food and Nutrition Section*

Grafton D. Bowers, D.V.M., R. R. 3, Baton Rouge, La., Veterinary Sanitarian, East Baton Rouge City Parish Health Unit

Marie E. Dohm, M.A., 737 S. Wolcott St., Chicago, Ill., Nutritionist, Cook Co. Public Health Unit

Rose E. Koshetz, M.S., Hotel Woodward, 210 W. 55th St., New York, N. Y., Dietitian, Adelphi Hospital, Brooklyn, N. Y.

Reginald C. Sherwood, M.S., Ph.D., 2010 E. Hennepin Ave., Minneapolis, Minn., Manager, Research Laboratories, General Mills, Inc.

John B. R. Woolley, 307 Encine, San Antonio, Tex., Director of Food Control, San Antonio Health Dept.

#### *Maternal and Child Health Section*

Bret Ratner, M.D., 50 E. 78th St., New York, N. Y., Clinical Professor of Pediatrics, New York Univ.

Elizabeth P. Rice, M.S., 789 Howard Ave.,

New Haven, Conn., Director of Medical Social Service, New Haven Hospital

Marian E. Russell, M.S., 205 W. Wacker Drive, Chicago, Ill., Exec. Sec., American Association of Medical Social Workers.

Catherine S. Sherwood, M.D., 121 N. Fir St., Ventura, Calif., Pediatrician, Div. of Maternal and Child Hygiene, County Health Dept.

#### *Public Health Education Section*

Lloyd W. Coe, State Capital, Room 1006, Lincoln, Nebr., Asst. Director, Div. of Public Health Education, State Dept. of Health

Miriam R. Hahn, 146 Filbert St., Hamden, Conn., Staff Member, Committee on Hygiene of Housing, A.P.H.A.

Kenneth F. Herrold, M.S.P.H., Bucknell Univ., Lewisburg, Pa., Instructor, Div. of Hygiene and Public Health

Anton T. Jirik, 1245½ W. Gouvernor St., Springfield, Ill., Supervisor of Exhibits, State Dept. of Public Health

Lillian C. Maynard, M.Ed., Deer Island, Boston, Mass., Student, Massachusetts Institute Technology

Bernice E. O'Brien, M.A., R.N., Glynn County Board of Health, Brunswick, Ga., Supervisor of Nurses

Frederic C. Woodward, LL.M., 122 S. Michigan Ave., Chicago, Ill., Chairman, State-wide Public Health Committee

#### *Public Health Nursing Section*

Marguirete M. Boom, 1004 Main St., Evanston, Ill., Public Health Nurse, Evanston Dept. of Health

Christine Causey, R.N., M.A., City Health Dept., New Orleans, La., Director of Nursing, Child Welfare & Community Health Assn.

Betty K. Clark, R.N., 1421 Home Ave., Berwyn, Ill., Public Health Nurse, Berwyn Health Dept.

Kathleen Clark, Health Dept., Winfield, W. Va., Public Health Nurse

Dorothy I. Fowler, Paris-Lamar County Health Unit, Paris, Tex., Senior Public Health Nurse

Mildred E. Gonyeau, C.P.H., 12 Olcott Ave., Bernardsville, N. J., Director, Visiting Nurse Association of Somerset Hills

Mary Matula, Minot-Ward Health Unit, Minot, N. D., Nursing Supervisor

Alma Kee McCracken, Box 707, Waynesville, N. C., Supervising Nurse, District Health Dept.

B. Elinor Suchy, R.N., 1621 South 61st Court, Cicero, Ill.

Juanita B. Williams, R.N., Box 1703, Pompano, Fla., Project Nurse, Florida Migratory Labor Health Assn.

Anastasia Wilson, R.N., S. Central Dist., Health Unit, Buhl, Ida., Public Health Nurse

*Epidemiology Section*

Howard P. Steiger, M.D., Christian County Health Dept., Hopkinsville, Ky., Venereal Disease Clinician, U. S. Public Health Service

Capt. Benjamin Zimmerman, M.C., Lovell General Hospital, Fort Devens, Mass., U. S. Army

*Unaffiliated*

William H. Clark, Jr., 3583 Life Sciences Bldg., Berkeley, Calif., Assoc. in Public Health, Univ. of California

Joy R. Dulaney, M.S., 220 Belvedere St., Lynchburg, Va.

Amelia L. Foote, 330 Willow St., New Haven, Conn., Student, Yale Dept. of Public Health

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MERIT SYSTEM CONSULTATIONS

PROVISIONS will be made at the 71st Annual Meeting of the American Public Health Association in St. Louis, October 27-30, for consultations between those concerned with the administration of merit system plans and

the staff of the Association conducting the Merit System Study under the auspices of the Committee on Professional Education. Appointments for consultation on this subject with Dorothy Deming, R.N., may be made through the Association office in the Auditorium.

## EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York, N. Y.

### U. S. CIVIL SERVICE COMMISSION

The Commission has announced again its need for public health nursing consultants in war work. The new announcement now provides for 5 grades and for appointments in the Children's Bureau, Department of Labor, U. S. Public Health Service, and Federal Security Agency. Salaries range from \$2,600 to \$5,600 a year. No age limits have been set. Positions exist both in the United States and foreign countries. War service appointments will be made to extend generally for the duration of the war and no longer than 6 months afterward. Duties are to carry out, in accordance with the rank of the position, nursing or nursing education programs; and to act in advisory capacity to Federal agencies, or to State, County, and municipal organizations.

There will be no written test, qualifications being judged solely from review of experience, education, and training of applicants. Persons applying must have completed a 4 year course in a recognized college and 1 year's special program of study in public health nursing approved by the National Organization for Public Health Nursing; must also have graduated from an accredited school of nursing affiliated with a hospital having a daily average of 100 or more bed patients; be registered nurses in a state or territory of the United States or the District of Columbia, and have had appropriate general public health nursing supervisory experience. Additional credit given for completion of approved college course in statistical analysis, public health nursing, supervision, social hygiene, tuberculosis control and maternity, pediatric or orthopedic nursing; also for certain appropriate experience as instructor, consultant, or investigator.

For positions in Children's Bureau additional progressive experience in specialized fields of maternal or child health is required for the top grade and may be substituted for part of the general experience prescribed for the other grades.

Applications must be filed with the U. S. Civil Service Commission, Washington, D. C., and will be accepted until the needs of the service have been met.

Forms may be obtained direct from the Commission or at any first or second class post office.

Merit System Council, Oregon State Board of Health and Crippled Children's Division, has announced merit examinations in practically all professional public health fields, including Health Officers, Nurses, Sanitary Engineers, Laboratory Workers, Vital Statisticians, Consultants in the fields of Health Education, Hearing and Vision, Nutrition, Oral Health and Physiotherapy. Two clerical positions, Fiscal Worker and Administrative Clerk are included in this list as is also the position of Merit System Personnel Technician.

Interested persons may get full particulars regarding the positions and examinations by writing H. J. Sears, Merit System Supervisor, P. O. Box 88, Portland, Ore.

The Indiana State Personnel Division, 141 South Meridian Street, Indianapolis, announces that applications may be filed at any time until further notice for the following positions:

Orthopedic Nursing Consultant I (women only) ..	\$150-200 mo.
Physician I (General) .....	165-250 mo.
Physician II (General) .....	250-325 mo.
Physician II (Tuberculosis)	250-325 mo.
Physician I (Psychiatric) ..	185-265 mo.
Physician II (Psychiatric) ..	250-325 mo.
Local Public Health Director .....	300-360 mo.

The California State Personnel Board has announced that applications will be received from citizens throughout the United States for the position of public health nurse in the State Department of Public Health, entrance salary \$150 a month.

Applicant must have license as registered nurse in California and certificate as public health nurse in that state, must have completed course in public health nursing at recognized university. Candidates from other states must submit evidence of application for license and certificate in California.

Applications must be filed by Octo-

ber 1. Forms and information may be obtained from California State Personnel Board office, 1015 L Street, Sacramento, Calif.

### POSITIONS AVAILABLE

Physician with either public health training or experience in local health department administration to serve as health director in a county health department in mid-western state. Salary \$4,000 and \$500 travel (flat rate). Well established department with offices in attractive little city of 10,000. Write Box T, Employment Service, A.P.H.A.

Western state department of health will consider applications from physicians to fill four existing vacancies among county health officers, one vacancy in venereal disease control and positions as laboratory technicians. Write Box S, Employment Service, A.P.H.A.

County Public Health Nurses for New Mexico. Must have 4 months' post-graduate instruction under one of the recognized public health nursing courses and 1 year's experience. Must drive and have a car. Address inquiry to State Health Department, Santa Fe, N. M.

### PUBLIC HEALTH ENGINEER

Responsible professional public health engineering involving field investigations and office studies in the application of sanitary measures. The more difficult engineering and sanitation field surveys include supervision over public water supplies, sewerage systems and sewage treatment plants and review of plans for same, and promotion and supervision of sanitation programs. Minimum qualifications: Training and experience equivalent to 3 years' civil engineering experience, including 2 years in public health or sanitary engineering; or completion of an aca-

demie year of graduate study and a year's experience in sanitary or public health engineering; and graduation from a college of recognized standing with a major course in civil or sanitary engineering. The salary range is \$205 to \$250 per month depending upon experience. Apply Box E, Employment Service, A.P.H.A.

### OTHER VACANCIES

Southwestern state health department seeks 2 physicians for assignment to district health units, personally to conduct several small venereal disease clinics on a rotating schedule. Experience preferred but not required. Salary \$3,000, plus actual travel allowance not to exceed \$1,200. Write Box V, Employment Service, A.P.H.A.

Wanted: Nurse for county health work. Salary \$1,800 per year with travel allowance (additional) of \$500 per year. Address District Health Department 2, West Branch, Mich.

Wanted: Supervisor of generalized public health nursing staff of 6 to 8 nurses. Beginning salary \$175 per month, with opportunity for increase to \$220 and travel expenses. Must be high school graduate, graduate of hospital of 100 beds, and must have at least 1 year's postgraduate study in public health nursing at a recognized institution, and 2 years' experience in general public health nursing under qualified supervision. Apply Box L, Employment Service, A.P.H.A.

The New Mexico State Department of Public Health will consider applications for the position of obstetrical consultant, Maternal and Child Health Division. Address inquiries to the State Department of Public Health, Santa Fe, N. M.

### POSITIONS WANTED

#### ADMINISTRATIVE

Teaching or administrative position desired by physician, aged 48. Experienced teacher in preventive medicine and public health, now employed at prominent medical school; 20 years' experience in municipal health administration and epidemiology. A-491

Physician, B.S., M.D., and M.S.P.H., University of Michigan, aged 35, experienced city-county health administration and as director university student health service. Will consider permanent responsible position offering good income. A-492

Physician with 25 years' full-time experience in public health administration is available for immediate appointment. Moderately hard of hearing; otherwise fully able. Salary \$4,500 or better. A-497

Physician, M.D., C.P.H., aged 47, seeks position in administrative work. Experienced in venereal disease control and industrial medicine. A-485

Physician, aged 47, M.D., Creighton University, M.S.P.H., Michigan, experienced in school health and as director of county health unit, seeks position as ad-

ministrator in state or local health department. A-498

Physician, aged 37, M.D., McGill, D.P.H., Toronto, experienced as health officer and director of public health training, seeks position in administrative work. A-499

#### WOMEN PHYSICIANS TRAINED IN PUBLIC HEALTH

Woman, aged 34, M.D., University of Basle, Switzerland, M.S.P.H., DeLamar Institute, Columbia University. U. S. citizen. Excellent references. Especially interested in industrial hygiene. A-493

Woman, aged 41, M.D., Columbia University, M.S.P.H., DeLamar Institute, experienced in epidemiology and research, seeks position offering administration experience. A-494

Woman physician, aged 48, M.D., University of Vienna. Excellent European pediatric experience. Seeks position in pediatrics, administration or statistical research. A-495.

Woman physician, M.D., Rush, M.P.H., Michigan, 13 years' experience in school medical service and administrative county health unit, seeks administrative position. New York area preferred. A-500

#### HEALTH EDUCATION

Woman with master's degree in health education, 12 years' successful experience

in public school and college teaching, administration and research. Will consider position in normal school, public schools, or in official or nonofficial health agencies. Prefers South or East. Available at once. H-501

#### LABORATORY

Bacteriologist, young man 28, with B.S. in industrial science, experienced in newspaper work, salesmanship and now employed in state department of health laboratory, seeks position as bacteriologist or doing promotional work of public health nature. L-465

#### MISCELLANEOUS

Veterinary Doctor, M.P.H., University of Pennsylvania, aged 27, with 2 years of practice, seeks position in food, meat, milk or livestock sanitation with state or local health department. Also interested in teaching position with research facilities. M-451

Public Health Nurse with M.A. degree wishes position in health supervision and teaching in college or public school. West preferred. M-452

Administrative Assistant or Health Educator, woman, M.A., 10 years' experience in health agency offices; 7 years' teaching experience, writer on health and other subjects, experienced in independent research, some training in social work, some hospital experience. M-453

#### Advertisement

## Opportunities Available

WANTED—(a) Supervisor; county department of health; competent executive required; central location. (b) College nurse; small infirmary; student health experience desirable; Pacific Northwest. (c) Student health nurse; public health background required; young woman's college; South. (d) Instructor in and supervisor of outpatient maternity nursing; university hospital; baccalaureate degree and 3 years' public health experience required; faculty appointment; most desirable location. (e) Public health nurse; degree or public health certificate required; \$1,800 to \$2,200. (f) Health supervisor; degree and public health experience required; duties consist of supervising health program of student and graduate staff; large hospital; approximately 170 students, 135 graduates; East. (g) Public health nurse; opportunity to become skilled in rural public health nursing; generalized program; Pacific Northwest. (h) Instructor in public health nursing; university medical center; East. (i) School nurse; Chicago area. Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

WANTED—(a) County health officer; woman eligible; South. (b) Physician for field position; woman eligible; state department of health; should be effective public speaker; will provide health training after year or so if not trained; Midwest. (c) Student health physician; well organized service; 640 students, 50 faculty; Midwest. (d) City-county health officer; college and industrial town of 26,000; venereal disease clinic operated in connection with public health department; excellent opportunity for developing department; Midwest. (e) County health officer; California. (f) Physician to head department of health and physical education; 900 students; town of 10,000; Midwest. (g) Young woman physician to joint student health department; young women's college; five physicians on staff; East. Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

## Situations Wanted

Dentist who has specialized in public health is available; D.D.S., university medical school; several years' private practice; year of postgraduate training in public health hygiene with special emphasis on public health dentistry for which he re-

ceived degree of M.S.P.H.; several years, state department of health; for further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

# NEWS FROM THE FIELD

THE BRITISH SCENE 1942

*Charles Porter, M.D., Honorary Fellow, American Public Health Association,  
Formerly Medical Officer of Health, St. Marylebone, London*

CIVIL defense, which at one time promised to absorb all the energies of all health officers in the United Kingdom (compelling them to organize the evacuating or the reception of evacuees; to perfect arrangements at first aid posts, air raid shelters, gas decontamination stations, and mortuaries; to muster forces of ambulance drivers, etc.), has now settled into place and the routine of public health is coming back into its own again. This pleases most of the service though, as nearly every health officer's annual report tells, staffs are but skeleton and it is only by efforts more or less superhuman that the normal items receive adequate attention.

It is not only staffs that are skeleton. Annual health reports themselves, at the request first of the Ministry of Health and more recently of the Paper Controller, have shrunk and shrunk until they are merely bare bones picked clean of everything that looks like information to the enemy. Very interestingly, and unexpectedly also, the figures in general are extraordinarily good. In spite of all the population have had to suffer at the hands of the enemy; in spite of domestic and what may be described as "domiciliary" upsets, a remarkable toughness and resistance have been shown by people of all ages and all ranks. The infants, for example, whether in the reception areas, where they should have been, or in their own homes, from which in spite of persuasion they have not been evacuated or to which against all advice they have been returned, have adapted

themselves to conditions and have shown no increased mortality or morbidity. In very many cases indeed officers have claimed record low rates in the war years. For England and Wales the infant mortality rate in the March quarter—always, of course, the most deadly in infancy—at 61 per 1,000 births, was the lowest ever recorded for that period.

Not only so; defying what appeared to be a particularly trying winter, babies arrived in larger numbers than for many years to give a birth rate of 15.3. And, having arrived, the babies found themselves in spite of the war or rather perhaps on account of it, in a land flowing, if not with milk and honey, with milk and black-currant juice and rose-hip syrup. Also for them there was a priority of claim on oranges and other things unobtainable by their seniors. Possibly as a drawback there was a chance that their mothers engaged in war work had to leave them for some hours each day. To make up for this, however, nurseries in plenty were provided where care and attention and affection entirely motherly were at their disposal. On the whole, therefore, it was not so bad a thing to be a wartime baby as might be supposed.

The school children and the pre-school children also have not found themselves too badly off. Certain fears on their account were of course entertained. It was thought, for example, that infectious disease rates would go up. Dread on this account, however, has proved to be almost unfounded. More interesting still, over and over

again in areas where enemy activity has been marked, it is recorded of the children that close examination has failed to reveal evidence of mental or physical disturbance. Frequently also it is noted that nutrition has not suffered noticeably either. One condition that has assumed proportions causing anxiety amongst adults as well as children is scabies. To this, and methods of dealing with it close attention is being given.

Because of fear of typhus fever, a disease from which this country for long has been free, lice have come to assume even more importance than usual. In most areas active steps have been taken to prevent infestation in air raid shelters and to provide for disinfection if necessary. In addition immunization against the infection is on offer and teams consisting of medical and other officers have been formed and are being trained to deal with the disease should it appear.

Mention may also be made of the fact that both in England and Scotland the big drive initiated some months ago to induce parents to take advantage of the immunizing procedure in the case of diphtheria has begun to show results. In Scotland particularly these have been striking. Here reports show that no fewer than two-thirds of the child population have been dealt with and that, whereas amongst the immunized there was one death only, amongst the non-immunized during the same period no fewer than 418 deaths occurred.

Not unexpectedly—having regard to what happened in the war of 1914–1918—tuberculosis has shown a tendency to increase, especially in the case of women. Curiously enough, however, there has been an increase in the case of children under 10. In this group in England and Wales the deaths in 1940 exceeded those in 1939 by over 750, nearly 500 being due to meningitis.

The need for getting together for

the purpose of discussing such occurrences and the steps that could and should be taken to deal with them has been greatly felt by the health service. Congresses and conventions on pre-war lines being out of the question, there was a falling back upon area and branch conferences and meetings. By reviving the so-called "Sessional Meetings" which had been abandoned at the outbreak of war, the Royal Sanitary Institute has rendered most valuable aid in this connection. These meetings in the ordinary way are held at intervals of six or eight weeks at various centers; one or two perhaps in London, the others, at the invitation of the municipality, in places such as Newcastle, Cardiff, Portsmouth, etc. The meetings extend over one or two days—Friday and Saturday, or Saturday alone. They prove very attractive, authorities in surrounding districts sending two or more of their number with the health officers to take part in and report upon the proceedings.

Though there is excellent reason for meetings of this sort, the meeting habit as a matter of fact has shown a tendency to increase. Apart from the Government which, of necessity, must give consideration to what might and should happen after the war is over, all kinds of bodies seem to have felt it incumbent upon them to go into questions affecting "Postwar reconstruction." After the war of 1914–1918 heroes, though promised homes fit to live in, did not actually receive them. By getting down to it early, bodies, official and nonofficial, have revealed a determination to achieve better results than those that came after 1918. As a matter of fact these better results will have to be achieved. Apart altogether from construction there is, as many of our American colleagues have seen, very much in the shape of reconstruction to be done. In one district alone there are 32,000 houses that will have to be recon-

structed or replaced, that being the number, out of a total of 36,000, that were damaged, badly damaged, or demolished.

In spite of such things, however, the people carry on bravely and, as is the habit here, even gaily. Indeed, in spite of the many sometimes agonizing blows received, there is an astonishing amount of gaiety apparent. Notoriously, of course, the Britisher grumbles, but so very much of it has something comic, even witty, about it, and rarely is resentment shown.

Rationing and queues and shortages, though a nuisance, are regarded as inevitable, but while there is admiration for the ingenuity of those responsible for the arrangements, for the black marketers and the racketeers, shopkeepers who enjoy saying "no," and restaurateurs, who reduce portions and raise prices, there is nothing but execration.

That the theaters and performances and shows begin and end at hours that make it necessary to eat too late or too early does not seem to affect attendances much. Also though we feel that by depriving us of the railings around our gardens, squares, and parks, the authorities have struck a shrewd blow at our cherished exclusiveness and love of privacy, we put up with it and keep on digging for victory and waging unceasing warfare against the various slugs, bugs, and beetles that appear to imagine that it is their victory we are digging for.

The fact of the matter is we are all

learning the art of "make do" and to appreciate as a certain author points out, that "comfort and discomfort are comparative terms and anything is more comfortable than it might be."

In medical circles what is found rather difficult is the shortage of personnel. American helpers as they arrive seem to be entirely absorbed and become just part of the service, and the call for more continues to be made. In the public health service, on the medical side, the shortage is acute and rapidly becomes worse. Quite early London University School of Hygiene abandoned courses of instruction and other schools have followed suit. That the step was justified is shown by the smallness of the number of entries for the examination for the special diploma.

Subordinate ranks are affected also but comparatively less. Entrants for the health visitors' certificate are fewer than normal but the numbers continue fairly good.

In the case of sanitary inspectors, on account of calling up, staffs certainly have been depleted and the numbers at present taking the examination and qualification one feels cannot entirely compensate. What is to be done to meet the big demand when the war ends is a question that is receiving very serious consideration. In the case of the sanitary inspector, the Royal Sanitary Institute has a scheme in preparation. The situation vis-a-vis the health visitor will also require attention and the matter no doubt is under consideration.



FELLOWSHIPS IN MEDICINE AND PUBLIC HEALTH OFFERED BY THE  
COMMONWEALTH FUND OF NEW YORK THROUGH THE  
PAN AMERICAN SANITARY BUREAU

THE Commonwealth Fund of New York, a philanthropic foundation established in 1918 by the late Mrs. Stephen V. Harkness, has announced that it is offering through the Pan American Sanitary Bureau fifteen fellowships for one year's study of public health subjects or postgraduate medical courses to properly qualified persons who are citizens of the other American republics. Fellowships in public health will be open to physicians, sanitary officers, technicians, public health nurses, etc. These fellows will be selected through a system of coöperation with medical and health authorities of the different countries concerned, and whenever deemed advisable they will be interviewed by traveling representatives of the Pan American Sanitary Bureau. Each fellowship will provide living

allowances while the holder is in the United States, travel costs, and tuition. Knowledge of the English language will be among the requirements, and also the possession of certain specific qualifications.

The Pan American Sanitary Bureau, the international health agency of the American republics, has been for some time the recognized clearing house for medical and public health fellowships in the United States, nearly 100 Latin Americans now being in the United States under its auspices.

Application blanks giving complete information will be available through the Commonwealth Fund, 41 East 57th Street, New York, N. Y., the Pan American Sanitary Bureau, Washington, D. C.; or chiefs of American Missions in Latin America.

A CHILDREN'S CHARTER IN WAR TIME

Leonard W. Mayo, Chairman of the Children's Bureau Commission on Children in War Time, reporting recently to the Commission, announced a joint Committee on Evacuation of Children established by the Director of the Office of Civilian Defense and the Director of Defense, Health and Welfare Services. Dean Landis, Director of the OCD, is to serve as Chairman and Martha M. Eliot, M.D., has been designated by the Office of Defense, Health and Welfare Services, to serve as Secretary. The joint committee includes in its membership representatives of the Children's Bureau, U. S. Department of Labor, and of the Office of Education, the Public Health Service, and the Social Security Board of the Federal Security Agency.

It has been agreed that the OCD, in coöperation with military authorities,

has the primary responsibility of formulating and executing plans for the evacuation of civilians and that it is the function of the ODHWS to provide for the health, welfare, and education of evacuees.

Among more than 100,000 Japanese aliens and American citizens of Japanese ancestry who have been moved from Pacific Coast military areas under orders of the Secretary of War, it has been found that more than one-quarter of the evacuees are second and third generation children under 15 years of age who are American born citizens.

According to Dr. Mayo there are still many problems to be settled, such as those relating to the relief of congestion through the construction of more adequate housing facilities, the provision of opportunity for self-support, the improvement of facilities for family life and the provision of health and welfare

services, schools and other essential community activities.

According to the report to the commission, there are in 33 states and territories no less than 325 military and industrial areas where urgent health needs of mothers and children are not being met.

Upon recommendation of the state health officers, the Children's Bureau is reserving \$198,000 of the Maternal and Child Health Fund for 1943 as available for grants to the states for providing medical service and hospitalization for the obstetric and pediatric care of wives and infants of men in the military services, according to Dr. Mayo.

#### INDUSTRIAL HYGIENE PROGRAM

The publication has been announced by the Division of Industrial Hygiene, National Institute of Health, U. S. Public Health Service, Bethesda, Md., of an outline of an industrial hygiene program for use in industry. Chapters include the medical service, the engineering and safety service, welfare services and medical care for non-occupational disability. The pre-placement examination, night work in rotating shift problems, better nutrition in the plant, and health and safety education for workers are also covered. Copies may be secured from the Division of Industrial Hygiene at the National Institute of Health.

#### INDUSTRIAL HYGIENE FOR FEDERAL EMPLOYEES

The Division of Industrial Hygiene, National Institute of Health, at the request of the Federal Council of Personnel Administration, has completed a survey of the dispensaries and hygiene services in federal departments located in Washington, D. C. For the most part, these dispensaries are established and operated by the departments and bureaus concerned. Of the 85 dispensaries employing 155 nurses it was

found that not more than 20 were under the supervision of a physician. In no government agency was there found a comprehensive program of environmental and personal hygiene and preventive medicine such as is recommended for private industry. The findings were forwarded by the Surgeon General of the Public Health Service to the Council on Personnel Administration in June. The recommendations included a good preplacement examination, including a chest x-ray, tests for syphilis, urinalysis, and other laboratory studies as indicated, treatment of minor medical emergencies, psychiatric consultation, nutrition consultation, elimination of environmental hazards, systematic reporting of absenteeism and the promotion of health education.

#### BELA SCHICK LECTURES

*Science* announces that, in honor of Dr. Bela Schick who is retiring after serving for 19 years as head of the Department of Pediatrics at Mt. Sinai Hospital, New York, N. Y., a fund of \$2,000 has been raised by his pupils, associates, and friends to establish the Bela Schick lectures in his honor.

#### 1941 UNITED STATES DEATH RATES

The Bureau of the Census, Washington, has announced that the lowest death rate in the history of the United States registration states was recorded in 1941. The provisional figures show a crude death rate of 10.5 per 1,000 population. The 1940 rate was 10.8, the figure for 1938 and 1939 being 10.6. There were 21,362 fewer deaths in 1941 than in 1940. According to the report, most of the decrease occurred in the rural areas, with leading declines in the District of Columbia, Idaho, and Vermont. The greatest increases in death rates for individual states were in Arizona and Virginia. The total number of deaths for the entire nation for 1941 was 1,395,507.

#### U. S. INDIAN MEDICAL SERVICE CURTAILED

The Commissioner of Indian Affairs, Washington, has announced that the medical service available for the Navajos will have to be curtailed as a part of the retrenchment growing out of reductions in the appropriations for the work for Indians throughout the country of \$13,000,000. A cut of more than half a million dollars in the budget for the Navajo Reservation will result in the closing of two hospitals at Leupp, Ariz., and Toadlena, N. M.

The position of Medical Director of the Navajo area will be abolished, effective August 15, thus releasing W. W. Peter, M.D., Dr.P.H., for service elsewhere. For the past 8 years Dr. Peter has had supervision of nine hospitals and three tuberculosis sanatoria as well as the oversight of a public health program for 53,000 Navajos. The reason for the present retrenchment is given as war necessity.

#### CALIFORNIA SOCIAL HYGIENE ASSOCIATION

The California Social Hygiene Association, San Francisco, has announced the appointment of Lawrence Arnstein as Executive Secretary with offices at 45 Second Street, San Francisco, in coöperation with the California Tuberculosis Association. Mr. Arnstein, with long experience in the business field, has for nearly 30 years been a member of the San Francisco Board of Health.

A coöperative plan between the San Francisco City and County authorities, the State of California, and the U. S. Public Health Service, looks toward the development of a so-called "amateur diversion program" which aims at the rehabilitation of younger prostitutes. Psychiatrists connected with the project include Dr. Ernest Lion, Dr. Karl Bowman of the University of California, and others. The California State Board of Health has provided funds to

equip a floor over the venereal disease clinic which is expected to be in operation by the first of September with the services of two psychiatric social workers. Active contacts are under way with labor unions in coöperation with the San Francisco Health Department, and an educational program has been begun.

Among the Board of Directors of the California Social Hygiene Association specially interested in this project are Ray Lyman Wilbur, M.D., President of Stanford University; Walter H. Brown, M.D., Stanford University; Roscoe Chandler, M.D., Dean of Medicine, Stanford University; J. C. Geiger, M.D.; San Francisco Director of Public Health; W. Ford Higby, Secretary of California Tuberculosis Association; Malcolm F. Merrill, M.D., Director of Venereal Disease Control, State Department of Health; Karl F. Meyer, Ph.D., Hooper Foundation, University of California; Langley Porter, M.D., formerly Dean, University of California Medical School; Milton Rose, M.D., Dr.P.H., Medical Director, American Red Cross, Western Division, San Francisco; Chester Rowell, Editor, *San Francisco Chronicle*; William P. Shepard, M.D., Metropolitan Life Insurance Company, San Francisco; Charles Edward Smith, M.D., Professor of Public Health, Stanford University.

#### DR. HANSON BECOMES FLORIDA STATE HEALTH OFFICER

Governor Spessard L. Holland of Tallahassee has announced the appointment, effective in July, of Henry Hanson, M.D., as State Health Officer for the Florida State Board of Health, with offices in Jacksonville.

Dr. Hanson has for the last several years been a staff member of the Pan American Sanitary Bureau, assigned to various South American countries. He previously served a term as health officer of Florida.

## INCUBATOR PLANS AVAILABLE

The Children's Bureau has available a new supply of plans for building two types of incubators and a carrier for premature babies, which were prepared by the National Youth Administration and the Children's Bureau.

If copies have been requested and have not been received an order sent now to the Children's Bureau, U. S. Department of Labor, Washington, D. C., will be filled promptly.

AWARD OF THE GEIGER MEDAL AT  
TULANE

The Geiger Medal for an outstanding thesis in the field of public health and sanitation has been awarded to Grace L. Ivanhoe, M.S., for her thesis on "Studies on the Transmission of Amebiasis in a Children's Home in New Orleans."

According to Dr. Ernest Carroll Faust, Professor of Parasitology in the Department of Tropical Medicine at Tulane, the problem involved the epidemiology of amebiasis in an infant home where there had been for more than 10 years a high incidence of amebiasis.

Attempts to eradicate the disease by therapeutic procedures alone had been a complete failure. An intensive study of the contacts of the children was undertaken and the particular dormitory was isolated where the children acquired their infection. Parasites were found widespread in their environment, on clothing, play objects, benches, floors, the water of their wading pool, and on clothing which had been laundered without boiling. Success followed after sterilization of the entire premises with live steam and routine use of anti-amebic therapy.

The Geiger Medal is an award presented to Tulane University, New Orleans, La., by Dr. J. C. Geiger, Health Officer of the City and County of San Francisco.

DR. STEICHEN JOINS MERIT SYSTEM  
STAFF

William P. Shepard, M.D., Chairman of the Committee on Professional Education of the American Public Health Association, has announced the appointment of Mary Steichen, M.D., M.S.P.H., as Subject Matter Consultant in Public Health Practice to the Subcommittee on Merit Systems of which George H. Ramsey, M.D., Dr.P.H., is Chairman. Dr. Steichen, who is a graduate in medicine of the University of Rochester, and in public health of the DeLamar Institute of Public Health, Columbia University, has been health officer-in-training under the New York City Department of Health for 2 years. She will aid in the development of tests in various public health fields, supplementing the work in public health nursing carried on by Dorothy Deming, R.N., and the test construction project under Cecil Brolyer.

## RESEARCH IN NUTRITION

The Nutrition Foundation, Inc., New York, N. Y., has announced that the research projects approved by the Board in 1942 include the following having a direct relationship to public health: methods for the detection of clinical vitamin deficiencies; quantitative relations of vitamin A intake to bodily store and well-being at different ages; relation of nutrition to dental caries in the monkey; the carotene and vitamin A content of market butters; conservation of vitamins and other nutritive values in dehydrated vegetables; the amino acid requirements of man; survey of the ascorbic acid content of Ontario-grown fruits and vegetables; nutritional deficiencies in the Atlantic region; relation of nutrition to cellular metabolism, with special reference to rheumatic fever and chemotherapy; factors which may alter calcium utilization by the adult man; influence of dietary factors on the healing of bone fractures.

Other projects that primarily advance the frontiers of the science of nutrition were announced as follows: development of bioassays for vitamins and amino acids; thiamin analysis and stability in cereal products; nature and content of pro-vitamin A pigments and content of ascorbic acid in tomatoes; studies of the vitamin B complex with the mouse as an experimental animal; biotin (vitamin H) metabolism in man; protein and vitamin interrelationships; the nutritional significance of biologically available methyl groups for man and various animal species; vitamin content of important plant foods; synthesis and metabolism of nicotinic acid in the rat; fluoride and phosphate metabolism of bones and teeth; metabolic fate of choline; the amino acid content of vegetables; quantitative study of nutrients of mother's milk under specific or known dietary conditions at different states of lactation; copper-containing proteins and their relation to the destruction of specific nutrients; to support the work of the Food and Nutrition Board of the National Research Council in developing and applying the science of nutrition; publication of authoritative reviews.

#### PUBLIC HEALTH IN HAWAII

M. F. Haralson, M.D., Territorial Commissioner of Public Health, Honolulu, has reported that, "in the interest of public safety and for the good of all persons," it had been decided to require immunization against typhoid fever and smallpox in the civilian population of the entire Territory.

The first military order required the immunization of the rural civilian population residing in the northern section of the Island of Oahu. Subsequent orders extended the area until it embraced all of Oahu, including Honolulu and the outside islands. The orders required vaccination against typhoid and paratyphoid fever of all persons

over the age of 3 years and the vaccination against smallpox of all persons over the age of 6 months unless such persons had been protected against the diseases since January 1, 1941. Provision was made for the exemption and deferral of those actually ill, infirm, aged, crippled, etc.

Immunization against diphtheria was not required by the terms of the military order but the procedure was strongly recommended by the health department.

This program was undertaken by the Board of Health, working in collaboration with the Office of the Department Surgeon, and advantage was taken of the fact that the entire civilian population of the territory had recently been enumerated and registered. Those over the age of 6 had been fingerprinted and issued identification certificates bearing personal data and a registration number. This fact provided a basis for planning and administering the immunization program, provided centers for immunization, permitted the calling in each day of an exact number of persons who could be handled at each center and the identification recorded.

According to Dr. Haralson's report it is believed that this is the first instance in the history of the United States in which compulsory vaccination for both typhoid fever and smallpox has been required of the entire population of a state or territory and it is believed that, for the first time, the vaccination status of every individual residing in a state or territory can be reported.

Dr. Haralson reported that coöperation was exceedingly satisfactory.

During the month of March, 1942, an outbreak of 74 cases of typhoid fever occurred in Honolulu, all but two of which were directly traceable to a cafeteria worker who was identified as a carrier.

# ILLINOIS CONFERENCE ON PUBLIC HEALTH TO MEET IN ST. LOUIS

Dr. Roland R. Cross, the Director of the Illinois Department of Public Health, Springfield, has announced that, because the American Public Health Association is this year holding its Annual Meeting in nearby St. Louis, Mo., the Illinois Department of Public Health has arranged as a war measure to hold its 1942 State Conference on Public Health in connection with the national conclave, thus saving busy Illinois health workers the time, expense, and travel that would have been required to attend two separate meetings. All Illinois residents interested in the promotion of public health are invited to attend the state-sponsored Illinois Conference on Monday, October 26, scheduled as a joint meeting with the Illinois Public Health Association, an affiliated society of the American Public Health Association. The preliminary program for the conference includes addresses by Dr. Cross and by Dr. Huntington Williams, Commissioner of Health of Baltimore, Md., and Dr. Henry F. Vaughan, Dean of the School of Public Health, University of Michigan, Ann Arbor.

## NATIONAL NURSING COUNCIL FOR WAR SERVICE

The National Nursing Council for War Service has published, with the approval of the Health and Medical Committee of the Office of Defense, Health and Welfare Services, and its Subcommittee on Nursing, and with the approval of the American Red Cross, a booklet entitled "Nurses, to the Colors!" which defines certain priorities in nursing to meet the war emergency.

According to this booklet, which has been released by Elmira B. Wickenden, Executive Secretary of the Council, nurses should serve with the armed forces if they are single, under 40, and are:

- (1) doing private duty
- (2) on a hospital's general staff
- (3) a head nurse not essential for teaching or supervision
- (4) a public health nurse not essential for maintaining minimum civilian health service in any given community
- (5) in a non-nursing position
- (6) an office nurse.

According to the Council, nurses should serve at home if they have positions:

- (1) in a hospital which has a school of nursing as
  - (a) administrator in a key position
  - (b) instructor
  - (c) supervisor
  - (d) head nurse, in a position related to teaching or supervision
- (2) in a hospital without a school of nursing, as
  - (a) administrator
  - (b) supervisor
- (3) in a public health agency, as
  - (a) administrator
  - (b) teacher and supervisor
  - (c) Staff nurse essential for maintaining minimum civilian health services in any given community
  - (d) industrial nurse

Nurses who are eligible and wish to enter military service should enroll in the First Reserve of the American Red Cross Nursing Service for assignment to the Army Nurse Corps or the Navy Nurse Corps. Further information is available from the National Nursing Council for War Service, 1790 Broadway, New York, N. Y.

## BUENOS AIRES SOCIETY FOR HISTORY OF MEDICINE

THE Society for the History of Medicine at Buenos Aires, Argentina, has elected as honorary members of the Society Esmond R. Long, M.D., F.A.P.H.A., Professor of Pathology at the University of Pennsylvania and Director of the laboratories at the Henry Phipps Institute, Philadelphia, and Henry E. Sigerist, M.D., Director of the Institute of the History of Medicine at Johns Hopkins University.

#### POLIOMYELITIS STUDY GRANT AWARDED TO JOHNS HOPKINS

The National Foundation for Infantile Paralysis, Inc., New York, N. Y., announced on July 13 that it had made a grant of \$300,000 payable over a period of 5 years to the Johns Hopkins University, Baltimore, for the establishment of a Center for the Study of Infantile Paralysis and Related Viruses.

According to the Foundation there is a need for units in which all the problems of poliomyelitis can be studied on a comprehensive scale and on a long-time basis to supplement the separate research grants now provided by the Foundation in leading institutions throughout the country.

The work at the Center will be under the direction of Kenneth F. Maxcy, M.D., Dr.P.H., Professor of Epidemiology in the University School of Hygiene and Public Health, who will be assisted by a group of scientists, including Howard A. Howe, M.D., David Bodian, M.D., and Robert C. Mellors, a biochemist from Western Reserve University. It is expected that other appointments to the staff will be made.

Laboratory space and facilities have been provided and the new grant will permit the investigators to carry on studies in the field as well as in the laboratory as opportunities may be presented. The ultimate objective is said to be the attainment of a more complete understanding of the spread of the poliomyelitis virus, not only within the human body but in the community. The project will involve epidemiologists, biologists, serologists, neurologists, and chemists.

#### A.M.A. PROVIDES FOR OBSERVERS OF HEALTH EDUCATION WORK

W. W. Bauer, M.D., Director of the Bureau of Health Education, American Medical Association, Chicago, has announced that the Trustees of the American Medical Association have author-

ized the Bureau of Health Education to accept postgraduate students, not more than two at a time, for two weeks or less of observation, demonstration, and participation in health education work as conducted by the Bureau of Health Education. Students would have no fees or tuition to pay and would make their own arrangements for maintenance.

#### ARMY JAUNDICE TRACED TO YELLOW FEVER VACCINE

Secretary of War Stimson said in Washington on July 24 that between January 1 and July 4, 1942, 28,585 cases of jaundice had developed among Army men, apparently as the result of inoculation with yellow fever vaccine. There had been 62 deaths from jaundice, or a case fatality rate of one in 461 cases. He announced that the Surgeon General of the Army had made a change in the form of yellow fever vaccine now used with the hope that it will eliminate the difficulty.

According to Mr. Stimson, the peak of the epidemic was apparently reached during the week ending June 20, when 2,997 hospital cases were reported; 2,575 cases were reported for the week ending July 4. Of the total cases 24,057 occurred at home, the remainder abroad.

It was explained that, because of the long period of incubation following inoculation before the jaundice developed, it had been particularly difficult to study the outbreaks. Members of an Army commission investigating the disease have recently stated that the jaundice was traceable to only a few lots of the vaccine and that it was almost certainly not a form of yellow fever which, under present conditions, could spread from person to person. The possibility has been mentioned that an extraneous virus may have entered certain lots of the vaccine through the supposedly normal human serum which is a component of the finished product.

### ILLINOIS ESTABLISHES THREE DEFENSE ZONE COUNTY HEALTH DEPARTMENTS

Dr. Roland R. Cross, Director of the Illinois Department of Public Health, has announced that, although Illinois has no law at present to enable all interested counties to provide adequate official county health services locally, state-subsidized full-time health departments, set up in defense zones under the emergency legislation now available, are already in action in three counties. The Lawrence County Health Department has been set up at Lawrenceville under Dr. D. F. Rawlings. The Lee County Health Unit has been set up at Dixon with Dr. A. L. Barbakoff, and the Williamson County Health Department headed by Dr. M. E. Cosand is established at Herrin.

In addition, Cook County, which is also a health defense area, has a full-time county health unit established in 1940 as a section of the County Bureau of Public Welfare and directed by Dr. E. A. Piszczek.

According to Dr. Cross, many of the remaining 17 counties which have been named as defense zones for public health purposes have expressed interest in developing effective local health services with state aid, and it is expected that a new defense zone health department may be opened in Will County shortly with Dr. C. A. Z. Sharp in charge. This leaves 81 Illinois counties still without power under existing law to set up county health services, there being 16 other defense counties now eligible for state aid.

### MASSACHUSETTS COMMITTEE ON PUBLIC SAFETY

The Massachusetts Committee on Public Safety, which has headquarters at 18 Tremont Street, Boston, and of which J. W. Farley is Executive Director, has a Health Executive Committee of which Professor Curtis M. Hilliard of Simmons College is the Director. Other

members include Manfred Bowditch, Ernest M. Morris, M.D., Sophie C. Nelson, R.N., Maurice E. Peters, D.M.D., Alton S. Pope, M.D., Arthur J. Strawson, Douglas A. Thom, M.D., James O. Wails, M.D., and Ruth White.

### TUBERCULOSIS CONTROL AS A WAR MEASURE

To prevent an increase in tuberculosis deaths, such as occurred in all countries during the last World War, the Public Health Service has begun x-ray examinations of its entire staff including commissioned officers and Civil Service personnel, both at headquarters and field stations.

The examinations are being conducted by the Tuberculosis Control Unit of the States Relations Division in cooperation with the Division of Industrial Hygiene, National Institute of Health. Surgeon General Thomas Parran said in announcing the program: "The armed forces have already undertaken x-ray examination of all enlisted men entering the services. The next specific undertaking should be the examination of all industrial employees, and an annual follow-up in certain groups of workers—all if possible." He also recommended that the men in the armed forces be reexamined at the end of the war, before they reënter civilian life. Personnel of the U. S. Public Health Service are to be reëxamined annually during the duration of the emergency.

### NURSERY CARE STUDY IN NEW YORK CITY

Mayor LaGuardia has announced that Leona Baumgartner, Ph.D., M.D., Director of the Bureau of Child Hygiene of the New York City Department of Health, has been designated to make a study of the existing facilities for nursery care in New York City. This is at the request of the Mayor's Committee for War Time Care of Children. Frank J. O'Brien, Associate



Superintendent of the Department of Education, is responsible for the standards for nursery schools.

#### NEW YORK STATE HEALTH OFFICERS ASSOCIATION

The New York State Health Officers Association at its meeting June 23 in Saratoga elected the following officers for the coming year:

*President*—William Runcie, M.D., Freeport.

*First Vice-President*—J. R. MacElroy, M.D., Jonesville.

*Second Vice-President*—G. E. Sanders, M.D., Dewey.

*Third Vice-President*—Burdge P. MacLean, M.D., Huntington.

*Secretary*—R. H. Wilcox, M.D., Tonawanda.

*Treasurer*—H. B. Doust, M.D., Syracuse.

#### NEW YORK STATE ASSOCIATION OF SCHOOL PHYSICIANS

At its meeting on June 22 in Saratoga, the New York State Association of School Physicians elected John E. Burke, M.D., Schenectady, to the office of President for the coming year.

Edgar Bieber, M.D., Dunkirk, was reelected *Vice-President*.

C. Adele Brown, M.D., Oswego, was reelected *Secretary-Treasurer*.

William E. Ayling, M.D., Syracuse, was elected a member of the Executive Committee as were Clarence A. Greenleaf, M.D., Olean, Lewis Wade Heizer, M.D., Watertown, and Michael Levitan, M.D., Rome.

## PERSONALS

### Central States

MAINE C. ANDERSEN, M.D., of Omaha, Neb., has been appointed Director of the Health Service at the University of Omaha, effective September 1. He succeeds JOHN C. SHARPE, M.D., of Omaha, resigned.

F. C. BEELMAN, M.D.,† formerly Director of the Division of Tuberculosis Control, and since October,

1941, acting Secretary and Executive Officer of the Kansas State Board of Health, Topeka, was appointed as Secretary and Executive Officer at the June 25 board meeting, taking the place of F. P. HELM, M.D.,† who was given leave of absence last fall for a year's postgraduate work in public health at the University of Michigan. Dr. Helm received his master's degree in June, was given a reserve commission as Surgeon in the U. S. Public Health Service, and has been detailed to the State of Texas as Deputy State Emergency Medical Service Chief, OCD.

CLAYTON C. BENJAMIN, M.D., M.S. P.H.† of Munsing, Mich., has been appointed in charge of the new County-City Health Unit, with headquarters in Ludington.

RICHARD F. BOYD, M.D., M.P.H.,\* has been announced as Chief of the Division of Local Health Administration, by Roland R. Cross, M.D.,† Director of the Department of Public Health, State of Illinois, Springfield, effective July 1. Dr. Boyd has been serving as Acting Chief following the death of MARVIN F. HAYGOOD, M.D., M.P.H.,† who was to have taken office on July 1.

ERROL V. BRUMBAUGH, M.D., of Milwaukee, Wis., has been appointed Health Commissioner of West Allis, filling the vacancy that occurred when FRANK H. RUSSELL, M.D., of West Allis, resigned recently.

DAN H. CAMPBELL, Ph.D., Assistant Professor of Immunology, Department of Bacteriology and Parasitology, Division of Biological Sciences, University of Chicago, has accepted an appointment at the California Institute of Technology, Pasadena, as Assistant Professor of Immunology.

PAUL T. COOK, M.D., has been made District Health Officer of six counties with headquarters in Valley

\* Fellow A.P.H.A.

† Member A.P.H.A.

- City, N. D., succeeding ROBERT G. WHITE, M.D.,\* who was transferred to Bismarck.
- GERRY B. DUDLEY, M.D., of Charleston, Ill., has been appointed a member of the Board of Public Health advisers in the Illinois State Department of Public Health, succeeding CLIFFORD U. COLLINS, M.D., of Peoria, Chairman, who resigned.
- LYMAN D. EATON, M.D., of Indianapolis, Ind., has been named Director of the District Health Unit at Princeton, covering Gibson, Pike, Posey, and Warrick Counties.
- GREGORY L. ENDRES, M.D.† of Omaha, Neb., has been named Director of the newly created Dodge-Saunders Counties Health Unit.
- F. K. HARDER, M.D., M.P.H.,\* Assistant Commissioner of Health in Cincinnati, Ohio, has resigned to accept the position of Health Director in the City of Greensboro, N. C.
- BARBARA A. HEWELL, M.D., Pediatric Coördinator of the Cincinnati Anti-Tuberculosis League, Cincinnati, Ohio, has resigned to become Specialist in Child Hygiene in the Division of Research in Child Development in the U. S. Children's Bureau, Washington, D. C.
- H. L. HIEBERT, M.D., is the new Director of Tuberculosis Control for the Kansas State Board of Health, Topeka, taking the place of F. C. BEELMAN, M.D.,† who was appointed Secretary and Executive Officer of the department. Dr. Hiebert formerly was on the staff of the Minnesota State Tuberculosis Sanatorium.
- FRANCIS R. HOLDEN, Ph.D.,† has been appointed Industrial Hygienist on the staff of the Industrial Hygiene Foundation at the Mellon Institute, Pittsburgh, Pa. Following his graduation from Hobart College at the University of Cincinnati, Dr. Holden has been connected with the Industrial Health Conservancy Laboratories in Detroit, and the Safety Department of the Pittsburgh Plate Glass Company.
- DR. DARLINGTON FRANK HOLTMAN, Instructor in Bacteriology at Ohio State University, has been appointed Assistant Professor of Bacteriology in the Western Reserve University School of Medicine, Cleveland. Dr. Holtman assumed his new duties on July 1.
- GLENN V. HOUGH, M.D., of Milwaukee, Wis., has been appointed Medical Director of the Marathon County Health Unit, Wis., succeeding ERNEST NEWMAN, M.D.,† of Wausau, who has a similar position at Las Vegas, Nev.
- NICHOLAS A. JAMES, M.D., of Tell City, Ind., is the new Health Officer of Perry County, Ky., it is reported.
- EVERETT A. KING, M.D.,† formerly of Fort Wayne, Ind., now of the U. S. Public Health Service, has taken over the work of the Health Office in the Tri-County Unit composed of Hancock, Breckenridge, and Meade Counties, Kentucky.
- FREDERICK P. KNAUF, M.D., of Kiel, Wis., has been appointed City Health Officer of Kiel, to fill the unexpired term of the late GEORGE MATHES, M.D., who resigned shortly before his death, February 19, after holding the position since 1900.
- PAUL A. LINDQUIST, M.D., M.S.P.H.,† of Manistee, Mich., has resigned as Medical Director of the Mason-Manistee-Benzie County Health Unit, to accept a similar position of the new County-City Health Unit being established in Monroe County.
- HOMER E. LINE, M.D., of Chili, Ind., has been appointed Health Officer of Miami County.
- MILTON E. PARKER,\* Manager of Production, Beatrice Creamery Company, Chicago, Ill., has been appointed

\* Fellow A.P.H.A.

† Member A.P.H.A.

Adviser to the Resources Division, Office of the Quartermaster General, War Department, Washington, D. C., on production and quality control of dairy products.

R. H. RIEDEL, M.D., Director of the Division of Venereal Disease Control, on leave of absence from the Kansas State Board of Health, Topeka, is on active duty with the Army, having been a reserve officer since 1928. He has a Captain's commission and is on duty at Camp Carson, Colorado Springs, Colo.

H. R. ROSS, M.D.,† resigned his position as Director of the Child Hygiene Division of the Kansas State Board of Health, Topeka, and has been appointed as Medical Consultant to the department. FRED L. MAYES, M.D., Assistant Director of the Division, succeeds Dr. Ross.

HENRY C. SCHOLER, M.D., has been named Health Officer of Monmouth, Ill., succeeding JAMES W. FIROVED, M.D., who resigned to enter the medical corps of the Navy.

JOHN D. WINEBRENNER, M.D.,‡ of Princeton, Ind., has been named Director of the newly created District Health Department No. 5, with offices in Columbus. The District includes Bartholomew, Johnson, Shelby, Jackson, and Decatur Counties.

#### Eastern States

GEORGE P. BERRY, M.D.,\* Professor of Bacteriology and Assistant Dean of the University of Rochester School of Medicine, Rochester, N. Y., received one of the 9 fellowships awarded by the City of Rochester for distinguished service at special ceremonies on May 22.

G. DONALD BUCKNER, S.B.,‡ Health Officer of Needham, Mass., has been appointed Executive Secretary of the

Southern Worcester County Health Association, Mass.

FRANK A. CALDERONE, M.D., M.P.H.,\* has been appointed Secretary of the New York City Department of Health, having been District Health Officer of the lower East Side Health District, New York City, for several years.

HENRY D. CHADWICK, M.D.,\* former Commissioner of Health, Massachusetts State Department of Public Health, has retired as Director of the Middlesex County Sanatorium and is now giving full time as Medical Director and Superintendent of the Cambridge Sanatorium, Cambridge, Mass. Dr. Chadwick was recently chosen President of the Massachusetts Tuberculosis League.

DR. RENÉ JULES DUBOS, member of the Rockefeller Institute for Medical Research, has been announced by Harvard University as the George Fabyan Professor of Comparative Pathology and Professor of Tropical Medicine at the Harvard Medical School, Boston. He succeeds DR. ERNEST E. TYZZER, who becomes Professor Emeritus.

DR. J. I. FEINMAN has been appointed a member of the teaching staff in Pharmacology, at the Philadelphia College of Pharmacy and Science, Philadelphia, Pa., as announced by Dr. Ivor Griffith, President of the College. Dr. Feinman, who graduated from the institution in 1928 and later received his medical degree, takes the place of DR. E. A. MULLEN, now on leave of absence and serving as Commander in the United States Navy.

ELIZABETH M. FINIGAN, Health Investigator for Institutions, Division of Communicable Diseases, New York State Department of Health, retired on May 1, after 29 years' service.

WILLIAM A. HOLLA, M.D.,‡ formerly Deputy Commissioner of Health in

\* Fellow A.P.H.A.

† Member A.P.H.A.

the Westchester County Department of Health, White Plains, N. Y., was appointed on July 28 as Commissioner of Health in the department, succeeding GEORGE H. RAMSEY, M.D., DR.P.H.,\* who recently resigned for reasons of health. Dr. Holla has been a member of the county staff since 1930.

### Western States

LEONARD A. DEWEY, M.D., C.P.H.,† of Seattle, Wash., Chief of the Division of Epidemiology and Venereal Disease Control, Washington State Department of Health, is on leave of absence to the U. S. Army. Dr. Dewey has been placed in charge of venereal disease control in the Eighth Corps Area, with headquarters in San Antonio, Tex.

WILLIAM A. POWELL, M.D.,† of Martinez, Calif., has been placed in charge of the administration of health affairs of the cities of Antioch, Calif., and Pittsburgh, Calif., recently trans-

ferred to the Contra Costa County Health Department. FRED P. NEVIUS, M.D., has been serving as Health Officer of Antioch, and GEORGE C. KELSO, M.D., as Health Officer of Pittsburgh. With the exception of the cities of Richmond and El Cerrito, nearly all of Contra Costa County is now under the jurisdiction of the county health unit.

### Puerto Rico

EDUARDO GARRIDO MORALES, M.D., DR.P.H.,\* who has been Commissioner of Health of Puerto Rico since 1933, retired as Commissioner on June 26, and on July 1 went on duty as Major in the Medical Corps, U. S. Army, at Fort Buchanan, San Juan, P. R. Dr. Garrido has been assigned a study of the malaria problem and is Medical Inspector of the camp. Dr. Garrido is currently a Vice President of the American Public Health Association.

## CONFERENCES AND DATES

American Association for the Advancement of Science. New York, N. Y. December 28-January 2.

American Association of State Highway Officials. St. Louis, Mo. December 7-9.

American Chemical Society—National Chemical Exposition, National Industrial Chemical Conference. Sherman Hotel, Chicago, Ill. November 24-29.

American College of Surgeons—Clinical Congress. 32nd Annual. The 25th Annual Hospital Standardization Conference, sponsored by the College, will be held simultaneously. Stevens Hotel, Chicago, Ill. October 19-23.

American Congress of Physical Therapy—21st Annual Scientific and Clinical Session. Hotel William Penn, Pittsburgh, Pa. September 9-12.

American Dietetic Association—25th Annual Meeting. Hotel Statler, Detroit, Mich. October 19-22.

American Hospital Association. St. Louis.

Mo. October 12-16.

American Library Association—Midwinter Conference. Chicago, Ill. December 28-31.

American Public Health Association—71st Annual Meeting. Headquarters, Municipal Auditorium, St. Louis, Mo. October 27-30.

American Public Works Association. Cleveland, Ohio. October 18-21.

American Society for Public Administration. Chicago, Ill. December 27-28 (tentative).

American Society of Civil Engineers—Fall Meeting. New England. October.

American Water Works Association—Michigan Section—Park Place Hotel, Traverse City, Mich. September 9-11.

Rocky Mountain Section—Frontier Hotel, Cheyenne, Wyo. September 17-18.

Western Pennsylvania Section—Roosevelt Hotel, Pittsburgh, Pa. September 18.

Minnesota Section—Lowrey Hotel, St. Paul, Minn. September 24-26.

Four States Section—Benjamin Franklin

Hotel, Philadelphia, Pa. October 7-9.  
 Southwest Section—Little Rock, Ark. Oc-  
 tober 12-14.  
 Kentucky-Tennessee Section—Irrving Cobb  
 Hotel, Paducah, Ky. October 19-21.  
 Wisconsin Section—Hotel Wausau, Wausau,  
 Wis. October 20-21.  
 Missouri Valley Section—Coronado Hotel,  
 St. Louis, Mo. October 22-24.  
 California Section—Hotel Oakland, Oak-  
 land, Calif. October 28-30.  
 North Carolina Section—Washington Duke  
 Hotel, Durham, N. C. November 2-4.  
 Virginia Section—November 5-6.  
 Florida Section—Miami, Fla. November  
 6.  
 Biological Photographic Association — 12th  
 Annual Convention. New York, N. Y.  
 September 10-12.  
 Civil Service Assembly—Annual Conference.  
 St. Paul Minn. October 1-3.  
 Conference on Venereal Disease Control Needs  
 in War Time. (To be held under the  
 auspices of the U. S. Public Health  
 Service.) Hot Springs National Park, Ark.  
 October 21-24.  
 Federation of Sewage Works Associations.  
 Cleveland, Ohio. October 15-17.  
 Indiana State Medical Association — 93rd

Annual Session. French Lick, Ind. Sep-  
 tember 29-October 1.  
 International Association of Milk Dealers.  
 Peabody Hotel, Memphis, Tenn. October  
 22-24.  
 Michigan Public Health Association. Grand  
 Rapids, Mich. November 11-13.  
 National Association of Public School Business  
 Officials. Cleveland, Ohio. October 5-8.  
 National Association of Social Workers—Dele-  
 gate Conference. October.  
 National Probation Association. Asheville.  
 N. C. October 19-23.  
 National Recreation Association—War Recrea-  
 tion Congress. Netherland Plaza Hotel.  
 Cincinnati, Ohio. September 28-October 2.  
 National Safety Council. Chicago, Ill. Oc-  
 tober 5-9.  
 New Mexico Public Health Association.  
 Raton, N. M. October.  
 New York State Association of Milk Sani-  
 tarians—20th Annual Conference. DeWitt  
 Clinton Hotel, Albany, N. Y. September  
 23-25.  
 New York State Association of Public Health  
 Laboratories—Mid-year Meeting. State  
 Laboratory, Albany, N. Y. November 6.  
 Tennessee Public Health Association. Nash-  
 ville, Tenn. September.

## Best Sellers in the Book Service for August

Standard Methods for the Examination of Water and Sewage. 8th ed. American Public Health Association.....	\$2.50
Standard Methods for the Examination of Dairy Products. 8th ed. American Public Health Association.....	3.00
Military Preventive Medicine. 3d ed. Lieut. Col. G. C. Dunham.....	3.25
Control of Communicable Diseases. Revised. American Public Health Association. . . . .	.25
The Sanitary Inspector's Handbook. Henry H. Clay. 5th ed.....	5.75
Rural Health Practice. Harry S. Mustard.....	4.00
Municipal and Rural Sanitation. 2d ed. Victor M. Ehlers and Ernest H. Steel..	4.00

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# American Journal of Public Health and THE NATION'S HEALTH

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## Epidemiologic Implications of Wartime Population Shifts\*

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IT is impossible to discuss at this time epidemiological implications of the convulsive shifts of population precipitated by total warfare in Europe and Asia. Adequate information is not available. From meager reports which have filtered through the censored press, it can be inferred that pestilential diseases—typhus, cholera, malaria, dysentery—have taken a tremendous toll of military and civilian populations in the devastated and impoverished countries which have been sucked into the maelstrom. The end will not come with cessation of hostilities. It will wait upon reconstruction of stabilized governments and communities.

Our concern on this occasion is with the danger to our own people from infectious disease as a result of disturbances due to the war. The United States has been preparing for this struggle with gradually increasing tempo during the past two years. Cities on the North American continent have not yet experienced the horrors of being

bombed and invaded. Nevertheless, great changes in the distribution of population and conditions of living have already taken place and are continuing. These changes are brought about by movements of three different kinds: (1) by migration of able-bodied men of military age from every walk of life and section of the country into induction and training centers of the Army and Navy; (2) by evacuation of civilian population groups from areas of military importance; and (3) by migration of workers and their families in boom towns adjacent to military and industrial establishments. Each has its peculiar epidemiological implications.

With regard to the first, the increased risk from infectious disease to recruits is a phenomenon well known since the dawn of history in all military undertakings. It is the primary concern of the medical and sanitary officers of the Army and the Navy. For the purposes of this discussion it suffices to state that in the mobilization of the armed forces of the United States for this war the experience up to the present has been far more favorable than was anticipated

\* Read before the Western Branch American Public Health Association at the Thirteenth Annual Meeting, Seattle, Wash., May 27, 1942.

on the basis of what happened in 1917-1918. With the construction of vast training establishments and the organization of medical facilities rapidly approaching completion, the period of greatest danger from the common infectious diseases would seem to be past. No serious epidemic has yet affected an Army and Navy of more than five million men.

With regard to the second, the evacuation of civil populations from limited areas for military reasons, there has been little experience so far. About 40,000 Japanese families are in process of being removed from the Pacific coastal area and re-settled in the interior of the country. The acquisition of land for military establishments and for training purposes, has required the dispossession and removal of some 10,000 native American families from limited areas widely distributed over the country but particularly in the southern states. These movements, however, are insignificant in comparison with what would happen if the threat of bombing and invasion became imminent. Such an eventuality must be considered.

Some idea of the epidemiologic implications of mass evacuations can be gained from an examination of what has happened in England. Even before the war actually began, the threat to civil communities was realized and plans were formulated. Air raid precautions demanded the evacuation of mothers and children from large industrial cities to the small towns and rural districts. Naturally, considerable anxiety was expressed that this movement might precipitate epidemics of diphtheria, scarlet fever, cerebrospinal meningitis, poliomyelitis, or other dangerous acute infectious disease. The following is an excerpt from an editorial which appeared in the *Lancet*,<sup>1</sup> just after hostilities had begun between Germany and England:

The complications of evacuation cannot yet be foreseen. In the hospitals they seem likely to amount to no more than inconveniences. Among the children the risk of infection cannot be denied. Children from crowded cities, which may be considered as permanent epidemic centres of the common infectious diseases, are carrying specific organisms into rural districts which may be, but often are not, permanent epidemic areas for those same organisms. The result will depend not so much on whence the emigrants came as on where they have gone, and the risk, where there is any, is much less to the evacuees than to those on whom they are billeted. The transference from one place to another will not necessarily disturb the epidemic equilibrium provided there is no overcrowding and the two places are in a similar epidemic state. Thus, if Portsmouth is evacuated into Bournemouth without overcrowding, Bournemouth has nothing to fear—a comparable migration takes place every year at holiday time and nothing usually happens. Where the children are sent to small circumscribed towns such as Ipswich, the effect may be different, for if such a town has been free from any one of the endemic infections for some time the immunity of the residents will be low and the risk of infection correspondingly high. Town children sent to isolated rural districts may then be expected to set up epidemic situations among the native population, severe if there is much increase in the population density, troublesome and lingering if the newcomers are well scattered. The risks of diseases not spread by droplets will depend mainly on the state of sanitation, and here again the sparsely populated rural district is the most likely to suffer.

In addition to this editorial there were a series of letters addressed to the Editor of the *Medical Officer*,<sup>2</sup> a journal for medical men in the government and municipal services, predicting that unless proper precautions were taken, or even in spite of precautions, the evacuation would precipitate a considerable increase in the incidence of infectious diseases.

The Air Raid Precautions Plan divided England and Wales into three types of areas:

- (1) Evacuation Areas—Whole cities or zones in certain cities from which selected groups of the population were to be moved

- (2) Reception Areas—Small towns and rural districts into which these groups were temporarily billeted
- (3) Neutral Areas—Those which were left relatively undisturbed

During the first week of September, 1939, when war was imminent, 1,270,000 mothers, children, and cripples were evacuated—including in the number three-quarters of a million school children—truly a mass migration. The school population in the evacuated areas decreased by approximately three-eighths, and that of the reception areas was increased by about one-third. Hundreds of thousands of rural homes had new inmates; many day, special, and nursery schools became residential schools. Overcrowding of living conditions was inevitable. Pressure of time did not permit many of the precautionary measures which had been thought necessary.

What effect this mass evacuation had upon the morbidity and mortality rates of England and Wales is still not entirely clear. Under the conditions which prevail, it is impossible to maintain undisturbed the level of completeness of reporting. The size and character of the shifting populations at risk in different geographic areas cannot be enumerated, but only roughly estimated. Pressure of war activity prevents field studies. Only crude analyses can be made. Some idea of what happened can be obtained from a few reports which have been published.

During the four months immediately following the evacuation from London, according to Glover,<sup>3</sup> the incidence of diphtheria and scarlet fever *decreased* two-thirds and of poliomyelitis one-third, as compared with the same quarter in the previous year. The deaths from scarlet fever were 27 per cent *less*; from diphtheria, 16 per cent *less*; from diarrhea and enteritis under 2 years of age, 27 per cent *less*. The experience with all of the other com-

mon communicable diseases was similarly favorable, and there were no epidemics of unusual infections.

More recently Stocks<sup>4</sup> has analyzed this experience in more detail, extending the observations through the following year, to the end of 1940. Using official morbidity reports and making certain assumptions with regard to the changes in the population census of the affected areas, he drew two broad inferences: (1) Removal of some 30 per cent of the children under 15 from evacuation towns, coupled with closure of the schools, was followed by a fall of 40 per cent or more in the rate of diphtheria *among the children who remained*, compared with (a fall of) 9 per cent in the neutral areas, by the first quarter of 1940. (2) Influx of children drawn from these towns *to the reception areas*, with consequent increase in their population at ages under 15 by about 30 per cent, was followed by an immediate rise of diphtheria *among the native children* amounting to 60 or 70 per cent, as measured by notifications, but the rate in the whole population of children in these areas (visitor and native) *declined* again within 6 months to its original level. The effect upon the scarlet fever rate was similar but more lasting.

The data upon which Stocks bases his inferences are questionable but, granting their validity, the effect of this mass evacuation upon the increased incidence of the common communicable diseases among the native populations fell happily short of the predictions and there have been no unusual epidemics of serious magnitude.

In the United States it has been the *third* kind of population movement which has been of importance up to the present time—the *migration of labor*. The movement of people in search of gold, money, and work is not a new phenomenon in this country, particularly in the north central and western



states, but this war has brought about a tremendous acceleration and changed the direction of the currents. The direction of flow is the reverse of that which has been discussed in connection with the evacuation of military areas. It is from country to city, from farming to industrial communities, from scattered to crowded living conditions. Employment services estimate that 600,000 workers will leave the farm in 1942. Thus, in a sense, the *rural districts have become evacuation areas and certain towns and cities have become reception areas.*

Boom towns are not a new phenomenon in the United States, especially in the West, but they have been created during the past two years at a rate that is staggering even to the miracle builders of Hollywood. With the amazingly rapid construction and expansion of military establishments and of manufacturing plants all over the country, peaceful villages have been converted into bustling centers of activity. New towns have sprung up almost overnight. Great stabilized cities and their environs have become whirlpools of human exchange. Many have doubled their populations in the past two years. An increase of 25 to 50 per cent in the total number of employables is not unusual. It is important to note that the movement has been one of *adults* to a greater extent than of children. Some workers have brought their families with them; others have left their children at home in care of relatives.

The migratory war workers have been living in tents, trailers, dormitories, barracks, warehouses, basements, and attics. Families have shared homes, apartments, even beds. Crowding in many areas has become intense. Provisions for more adequate housing are going forward rapidly, but some time must elapse before the shortage is overcome.

What are the epidemiologic implications of such situations?

An experience to which I would like to direct attention is that of Halifax,<sup>5</sup> Nova Scotia. Before the beginning of hostilities, this was a relatively unimportant center of commerce with a stabilized population of about 60,000. With the opening of war in 1938, as in 1917-1918, it became an exceedingly important port. The civilian population increased rapidly with the arrival of thousands of workers and their families. The military garrison was greatly strengthened. There was a constant stream of transients with the arrival and departure of convoys. The epidemiologic implications are evident—crowding, a shifting immunity status, and the possibility of introduction of new strains of parasitic microorganisms from Europe or elsewhere.

For ten years previous to the war, diphtheria had prevailed in that city endemically at a low level. There had been no active campaign to immunize the child population artificially. Schick surveys made in 1940-1941 indicated that 80 per cent of selected groups of adults, as well as of the children, were susceptible.

In September, 1940, cases of unusual severity appeared. Apparently a new and virulent strain of *Corynebacterium diphtheriae* had been introduced. The number of cases reported rose rapidly to reach twenty times the expected incidence during the next three months, attacking adults even more frequently than children. In the civilian population 588 cases were reported, and 303 cases occurred in the military forces. As a result of aggressive measures by the health authorities and medical profession, the epidemic declined somewhat but the disease continued to prevail at a high level throughout the following year and indeed up to the present time. During the same period there have been reported in this city some 600 cases of

scarlet fever and more than 100 cases of epidemic meningitis. Since early in the current year the situation has improved.

This exemplifies the experience of a city in which the epidemiologically expected happened. By way of contrast, I should like to refer to that of a similar urban industrial maritime situation in which it has not.

Previous to the beginning of war preparation, the combined population of the Norfolk-Newport News (Va.) area amounted to about 350,000. With the development of industrial, military, and naval establishments, it has become one of the most important centers on the coast. In two years the population in this area has been almost doubled. Epidemic potentialities have developed similar to those noted for Halifax so far as the housing shortage, crowded living conditions, changing immunity status, and the constant mixing of transient and native populations are concerned. In addition, there has been an acute water shortage. Rationing of water has been necessary for some months, and relief through bringing in a new supply is not expected until the latter part of the current year. In spite of these conditions, up to the present time no significant increase in the infectious diseases has been reported.

The experience of the Norfolk-Newport News area is not unusual. In many other cities and towns conditions which might be classified as epidemiologically dangerous have developed. The surprising fact is that, in spite of the crowding of people into these reception areas and the disturbance of living conditions during the past two years, there has been little, if any, increase in the incidence of infectious disease. For this increase to be sufficiently great in a limited population group and time interval to merit recognition as an "epidemic" requires the fortuitous coincidence of a complex mosaic of fac-

tors, only a few of which are known and many a matter of speculation. This is the hazard of epidemiological prediction.

By way of explaining the unexpectedly favorable experience of both civil and military populations thus far, certain generalizations deserve consideration. The population shifts have occurred with gradually accelerating tempo. There have been as yet no convulsive evacuations such as those which occurred when the countries of Europe were engulfed in war with lightning-like rapidity. The start was made from a position more favorable than has ever been realized before by any great nation in the health and welfare of its people. This country has been realizing dividends on the last quarter-century of intensive public health organization. For example, the conquest of intestinal infections, especially typhoid and dysentery, by environmental sanitation has depleted the human reservoir of infection. The frequency of healthy carriers of intestinal pathogens per unit of population has greatly decreased. The risk from drinking a public water supply contaminated with human sewage is by no means as great as it was. The public, and those who plan for the public, have been educated and are aware as no people previously have been of the fundamental necessity of maintaining public health and sanitary safeguards. Artificial immunization against smallpox, diphtheria, and typhoid fever protect a far larger proportion of the people than before. The venereal infections, gonorrhea and syphilis, have received extensive attention and constitute a special problem which need not be discussed here.

There remain, however, certain respiratory infections whose spread cannot be prevented and against which there is available no means of artificial immunization, as those caused by viruses such as measles, chickenpox, mumps, and the influenza group, and

by bacteria such as pneumococci, hemolytic streptococci (Group A), and meningococci. These thrive where humanity is crowded together. Is the absence of epidemics from these infections among adult populations temporary and fortuitous, or due to factors which are of a more or less permanent character? If the latter, is it due to (a) earlier and more widespread acquisition of immunity to the prevailing strains through clinical or subclinical attack, (b) conditions of living and of personal hygiene which are less favorable to parasitic propagation, (c) some change in the prevailing strains modified in the direction of lower pathogenicity, or (d) some combination of those factors?

With regard to the first hypothesis, it is notable that since the World War of 1917-1918, with the advent of the family automobile, extension of good roads, auto busses and aeroplanes, and such institutions as the "consolidated school" and the "movie," there has been a remarkable change in the frequency and range of human contacts in this country. In the modern United States few communities can any longer be considered isolated in any real sense of the word. Exposure to common infections must be at an earlier age and relatively fewer persons escape attack in childhood.

Some indication that such a change is actually taking place is suggested by a statistical analysis of the age distribution of reported cases of measles in Maryland. Measles is an example of a common infection to which everyone is exposed sooner or later. To compensate for differences in the completeness of reporting, the attack rate at each age was expressed as a ratio of the attack rate at all ages. The specific age ratios for Baltimore, representing an urban community, were compared with those for the rest of Maryland, predominantly rural. It was found that

children in the city are still (1935-1940) attacked at an earlier age than are those living in the rural part of Maryland, but the age of attack among children living in the rural areas today is almost the same as that of the children who lived in the city before the last war (1917-1918).

These data are limited, but they lend support to the conception (1) that the changes in living conditions of the past quarter-century have tended to accelerate and broaden the antigenic experience of the younger generation, and (2) that a greater proportion of the young adults who enter camp and industrial areas are immune to common infections. On the other hand, it is difficult to reconcile this concept of earlier and more intensive natural immunization with the observed fact that the trend in the death rate among children from infectious diseases has been progressively downward during recent years.

During this same period an increasing proportion of the public have acquired better habits of personal hygiene. Promiscuous spitting, sneezing, and coughing in public places have been reduced. The use of paper drinking cups has become popular. Greater cleanliness in the methods of handling and serving foods is demanded. Housing and ventilation have been improved. These and other changes in the hygiene of living have had a definite, though immeasurable, effect in reducing the volume and rate of exchange of respiratory pathogens. Finally, and perhaps most important of all, it must be borne in mind that lowered infectivity and pathogenicity of the prevailing strains may be the important factor. If so, the introduction of new strains may take place at any time and lead to increased morbidity and mortality from respiratory infections.

Since the relative importance of these and other unknown factors can-

not be evaluated, only time will tell. The balance between the human host and certain of these parasites may already have been disturbed to an extent that a downward or stationary trend has been converted into a rise. Not yet apparent in the form of epidemics, it will be reflected first in the rates of endemic incidence.

Within the last two years there has been a definite increase in the incidence of cerebrospinal meningitis—a disease which is a sensitive indicator of the effect of population shifts and crowding. In England and Wales the reported cases were as follows: 1938, 1,288 cases; 1939, 1,500 cases; 1940, 12,500 cases.<sup>6</sup> In spite of a lowered case fatality rate due to chemotherapy, the deaths from cerebrospinal fever in the first two years of the war, up to the third quarter of 1941, were about four times as numerous on the average of the years as in 1938–1939.<sup>7</sup> In the United States this disease has shown a definite increase since the first of this year. Up to the week ended June 27, the total number of cases reported to the Surgeon General of the U. S. Public Health Service was greater than for a similar period in any year since 1937. Significantly, the increase appeared in the Eastern Seaboard states—Massachusetts, New York, Pennsylvania, New Jersey, Maryland, the District of Columbia and Virginia—and in California, the industrial areas into which people have been crowding.

In this discussion an age-old enemy of mankind, and a reliable index of physiological, social, and economic well-being, must not be forgotten. In England and Wales deaths from respiratory tuberculosis increased by 6 per cent in the first year, and by 10 per cent in the second year of the war.<sup>7</sup> In the United States,<sup>8</sup> judging by the experience of the Industrial Department of the Metropolitan Life Insurance Company, the death rate from

tuberculosis of the respiratory system has maintained its downward trend among industrial policy holders through the first five months of 1942. Sufficient time has hardly elapsed, however, to expect to find a definite indication of a change in the trend in death rates from a disease of long duration.

The epidemiological implications of population shifts with regard to exotic tropical diseases is more difficult to assay. Their importance to the armed forces in Africa, the West Indies, Central America, and the Far East is real and immediate. The threat to the civilian population of the United States still seems remote, with one possible exception, and that is yellow fever. The spread and volume of air travel under the exigencies of military and naval operations has rendered ineffective such measures of quarantine as were formerly in force. That there are sufficient numbers of *Aedes aegypti* in certain towns and cities of the southern United States to support an epidemic is indicated by the outbreaks of dengue which have occurred within recent years. The only remaining defense against importation is specific immunization of exposed persons.

#### SUMMARY

Although the continental United States has not yet been engulfed in devastating warfare, industrial and military mobilization has brought about extensive population movements which are continuing. The shifting has been principally an evacuation from the rural districts to urban reception areas. In many of the cities and towns adjacent to military and industrial establishments conditions have been created which are potentially dangerous from an epidemiological viewpoint. Yet the experience thus far from infectious diseases has not been unusual. The period of elapsed time has been

relatively short. The trend of certain infections which are indices of social welfare should be followed with careful attention. The potential hazards in the immediate future would seem to be principally from viruses and bacteria with which we are already familiar, especially those which are parasites of the human respiratory tract.

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# Protection of Water and Food Supplies in an Emergency\*

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WAR causes many changes in the normal way of life. Some of the expected changes are population shifts, new production methods, shortages of important materials, substitutions, lower standards of manufacture and inspection, and the appearance of new products and new methods.

An emergency may be created in any one of a number of ways, other than by war—from fire, flood, hurricane, earthquake. For the purpose of this paper the emergency resulting from war or enemy action is used as an example, but many of the matters discussed could originate in any one of a number of ways.

Food is obviously essential for maintenance of civilian health and morale, as well as for military personnel and defense production.

Water is the life blood of any community. Its use for washing, sanitation, drinking, food preparation, and to fight fire, is so completely taken for granted that it is seldom thought of until the supply is interrupted or cut off entirely.

## WATER SUPPLIES

The following are a few things that may happen to a water system in an emergency:

The system may be seriously over-

loaded by increased population and war production. Drought or enemy action may result in depletion of the supply. Lack of material may result in the substitution of inferior materials for construction and repair. The water system may be affected through enemy action by bombing, shelling, sabotage, gas attack, power failure, poisoning, or bacterial pollution. All of these things can be fairly and adequately met by proper precautions.

America has the highest standards of water supply in the world. These standards must be maintained. The water supply should be protected at its source against the possibility of pollution or enemy action. The water treatment plants should be protected. The transmission and distribution systems should be surveyed for defects, and protective measures should be taken.

In protecting a water system against accidents, or against trespass which may result in sabotage, a number of points should be mentioned. Visitors should be excluded from operating properties of the water system. These properties should be fenced and posted with conspicuous signs warning against trespassing. Guarding is frequently over-emphasized. Guarding of property by a man is the most expensive form of protection, and results are not always satisfactory. Guards, where used, should not be posted in conspicuous or isolated places without some protection

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to themselves, such as fencing or alarm devices. Guarding should be correlated with a communications system, the guards being required to report in at frequent, regular intervals. Should any guard fail to report on schedule, the reason should be investigated.

Many people are concerned about the possibility of poisoned water supplies. The mechanics involved in poisoning a public water supply are such as to minimize the likelihood of this type of sabotage. Large quantities of poisonous compounds are necessary to poison a water supply effectively. These compounds are frequently expensive and not readily obtainable. Most poisons tend to hydrolize rapidly in water and are not effective unless thoroughly mixed with the water.

Certain simple tests can be readily made by any laboratory or water works man for the detection of unusual conditions indicating pollution or poison in the water supply. A sudden change in pH is an indication of some unusual condition in the water. A sudden decrease in the dissolved oxygen content, or an increase in the oxygen consumed value indicates the presence of an organic substance which may have been added to the water. A sudden increase in chlorine demand or a disappearance of the chlorine residual indicates the presence of an unusual substance. The sudden appearance of a taste, odor, or color in water should be investigated. These tests are simple, easy to make, and are a good indication of any unusual condition in the water supply.

Bacterial pollution of water supply is also a possibility, but again the mechanics involved in obtaining and introducing disease organisms reduce this possibility. A chlorine residual throughout the distribution system provides one safeguard against this type of contamination. Frequent bacteriological examinations of the water supply should be made.

Usual methods of water treatment, consisting of coagulation, filtration, and chlorination provide reasonable safeguards against bacterial and chemical pollution.

Bombing and shelling introduce complicating factors. Bombs may break parallel water and sewer pipes and the bomb crater may fill up with a mixture of water and sewage. The sewage is likely to drain off into the water system. The occurrence of fire, which nearly always accompanies bombing or shelling, results in great increases in water consumption with attendant low pressures.

To meet this emergency situation there is being developed throughout the country a mutual aid plan involving the exchange of materials, supplies, equipment, and personnel. An inventory of these materials is being made and an organized plan of exchange among water systems is being worked out under the direction of water supply coördinators who are part of the Civilian Defense organization.

The mutual aid plan also seeks to provide auxiliary water supplies for use in event of failure of the regular supply connections between water systems of adjacent communities, emergency chlorination and treatment of auxiliary supplies, provision of auxiliary power sources in the event of power failure, and protection of the sources against subversive action. This plan has been thoroughly organized in most localities, and is ready to function in an emergency. Any community not having such an organization should start one.

#### FOOD SUPPLIES

Any one of the following things may affect the food supply of a community: bombing, shelling, gas attacks, sabotage, lower standards of raw foods, lower standards of food preparation, lack of inspection, and the use of substitute foods.

In an emergency, supplies should still be protected from the source to the ultimate consumer. Lack of personnel already threatens a lowering of inspection standards. It is imperative that inspection be carried on at the usual level.

Unusual circumstances, such as blackouts, increase the problems of preparing and handling foods. Changes in the use of containers and of material in containers have introduced new problems. The use of new types of containers requires careful supervision to insure proper sanitation. The possibility of polluted water supplies used in food manufacture should be watched and guarded against.

#### STORAGE OF FOODS

With increased complications in transportation, and the possibility that portions of the country may be isolated by enemy operations, there is a likelihood that storage of foods will become necessary in some locations.

In England special buildings have been constructed for the storage of food. The buildings measure approximately 120 x 220 feet and hold 8,000 tons of food. They are built of reinforced concrete, and all openings can be tightly sealed against gas attacks. The construction of such buildings is probably not necessary in this country, but provision should be made for the storage of foods in existing structures. Where possible, food should be stored in or near a hospital or institution where large quantities of food are regularly used. The institution can use up the older stock first, to maintain a regular turnover and reduce the likelihood of spoiling. Regular inspection should be made of all stored foods to see that they are in good condition. Precautions should be taken to protect foods against insects and vermin.

#### BOMBING AND SHELLING

A bomb burst will shatter glass panes

for a considerable distance from the blast itself. Shattered glass, flying in all directions, may readily destroy food. The explosion also raises dust, which settles on exposed food. By way of precaution the quantity of food on display should be reduced to an absolute minimum, especially that displayed under glass. Slivers of glass driven into meat may not be detected until the meat is consumed.

In some cases it may be desirable to protect certain storage plants by sandbagging or protective walls. Due to the shortage of bags and their tendency to deteriorate, sandbags are not favored. A simple protective wall may be formed by constructing wooden forms, as is done for a concrete wall, and filling them with an earth-asphalt mixture.

Refrigeration machinery, which is expensive and difficult to replace, should be protected against damage. The escape of refrigerant gases in case of a bomb hit or near-miss may complicate the situation. Storage plants should be effectively blacked out so that they can operate continuously. Ventilation is difficult during blackouts except by forced draft. Provisions should be made to clear refrigeration gases from plants as quickly as possible after bombings; some gases, particularly ammonia, are toxic in low concentrations.

#### GAS DAMAGE

Gases used in enemy action are of two types, persistent and non-persistent. The persistent gases such as mustard and lewisite come in an oily form which slowly vaporizes. The non-persistent gases are mostly irritants and smoke; they are readily dispersed by the wind. Following a persistent gas attack any contaminated material should be treated to neutralize the effect of the gas.

#### PROTECTION OF FOODS AGAINST GAS

The greatest danger to foods comes from the oily vesicant gases.



### 1. *Protective Measures*

a. Wherever possible vulnerable foods, e.g., those stored in sacks, hessian wrappings, open crates, etc., should be stored elsewhere than on top floors or in basements.

b. Tarpaulins, preferably of the impervious, oil-painted variety, or oilskins are the best kind of cover for storage of foodstuffs in packages. They give good protection against oily splashes of liquids such as mustard gas. Such protection greatly reduces the labor of the decontamination personnel.

c. Wherever practicable the tarpaulin should closely cover the pile of packages, but when this is not convenient it can be arranged as a covering fastened on hooks or frames so as to form a screen or curtain. Where free circulation of air is essential for satisfactory storage, as for fresh fruit in crates, etc., the screens or curtains should be arranged so that they can be pulled into position as soon as a raid warning is given.

d. Canvas or sacking can be used for coverings or screens when tarpaulins or oilskins are not available. They give no protection against gas or vapors, but soak up the oily drops of liquids, thereby reducing contamination. Anything that helps to protect the food containers from being splashed is of value.

e. Food in chambers, such as refrigerator stores, cold rooms, gas chambers, etc., requires no additional protection from gas, providing the doors are reasonably gas-tight and precautions have been taken against contaminated air entering by a ventilation system.

### 2. *Decontamination*

a. Bulk supplies of food which have become contaminated by poison gas should not be touched except by those fully trained in decontamination methods and adequately equipped with protective clothing, respirators, etc. Rough-and-ready attempts to decon-

taminate may lead to injury of persons and to loss of food which otherwise might have been salvaged. If trained personnel is not immediately available, a report should be made without delay to a gas officer or to the health department.

### 3. *General Precautions against Gas*

a. Refrigerators and cold storage lockers give good protection against gas if they are reasonably airtight. Doors and fittings should be examined to see that they are in good condition.

b. The exposure of food in windows or on open shelves, where liability to contamination is greatest, should be reduced to a minimum.

### 4. *Precautions to Be Taken in the Event of an Air Raid Warning*

a. All windows, doors, shutters, etc., should be closed, and any other precautions taken which time permits, to shut off the food supplies from contact with the outside air.

b. Extractor fans or other artificial ventilating systems that draw outside air into the food store or chamber should be shut off.

### 5. *Protection of Foodstuffs in the Home*

a. Store as much food as possible in cans with tight-fitting lids or in bottles with good stoppers or screw-caps. Clean, dry biscuit cans serve to hold supplies of flour, rice, pea-flour, and similar non-perishable foods. If they are reserve supplies the cans or bottles can be carefully wrapped before being put in a cupboard or on a shelf.

b. Perishable foods, such as meat, fish, eggs, milk, butter, etc., are quite safe if kept in one of the ordinary types of domestic refrigerator, providing the door forms a reasonably airtight seal. In other cases, protection for perishable foods should be contrived by the intelligent use of cans, bottles, or wrappings of the type mentioned above.

6. *Food and Livestock in Markets*

a. All contaminated food should be held until it has been inspected by the local public health officials, who will decide whether it can be decontaminated or whether it must be destroyed.

TABLE 1

## MATERIALS USED FOR COVERING OR HOLDING FOODSTUFFS

<i>Nature of Covering</i>	<i>Protection against Poison Gas or Vapor</i>	<i>Protection against Liquid Poison Gas</i>
Sealed metal drums	Complete	Complete
Sealed metal-lined cases or casks	Complete	Complete
Sealed cans	Complete	Complete
Cans with well fitting lids but not sealed	Fairly good	Good
Glass bottles, glazed earthenware vessels, with well fitting stoppers or lids of glass, metal, bakelite, or similar impervious materials	Complete	Complete
Bottles or glazed vessels with ordinary cork stoppers	Fairly good	Good
Sealed wooden barrels such as are used for transporting and holding liquids	Complete	Complete, except in cases of heavy and prolonged contamination which may impregnate the wood to a significant depth
Bottles and jars covered by grease-proof paper	Fairly good	Moderate, but additional protection can be provided by an outside covering of a transparent cellulose wrapping *
Waxed cartons	Good if well sealed	Good if all joints are waxed or covered by a layer of a transparent cellulose wrapping
Papier mache cartons	Good if well sealed	Fairly good. A transparent cellulose wrapping gives additional protection
Transparent cellulose wrappings	Good	Good
Metal foil wrappings	Good if no pinholes	Good if no pinholes
Oilskins, tarpaulins	Fairly good	Good
Bags lined with transparent cellulose wrapping	Good	Good
Grease-proof paper	Good	Fairly good if contamination slight
2- or 3-ply bitumen or tar-lined paper	Good	Fairly good if contamination slight
Wooden boxes	Good if all joints tight	Poor. Soft woods are very absorbent
Thick cardboard boxes	Good if all joints tight	Poor, very absorbent
Paper containers	Poor	None
Sacks, canvas, hessian, and other textiles	None	None (except when used as screens)

\* Many types of cellulose wrappings are on the market. Those prepared from cellulose, cellulose acetate and nitrocellulose are, in general, good as protective wrappings against gas. Those based on benzyl cellulose are less satisfactory.

## PROTECTIVE CONTAINERS

Protection of foods against gas can be adequately accomplished by the use of a proper container. Some containers are quite effective, others are almost entirely ineffective.

*Protective Value of Materials Used for Holding or Covering Foodstuffs*

The relative protective value of a number of materials commonly employed for packing foodstuffs is shown in a list (see Table 1).

## THE EFFECT OF GAS ON FOODS

Gas has a very definite effect on most foods. Some foods can be salvaged following gas attacks, others must be destroyed. The following table is presented giving some foods indicating the effects of phosgene gas. The same effects may be considered with other gases except that the arsenic gases are definitely dangerous. Mustard is more

persistent and more difficult to treat than phosgene.

## MILK

Milk, an essential food in any community, should be protected against damage. Bombing may destroy milk plants. Substitute plants should be available, or some other means of handling the milk supply should be provided. The milk industry might well consider the possibility of a mutual aid plan for the handling of milk.

Pasteurization is essential to the protection of milk supplies, and provisions should be made for emergency pasteurizing plants. Cheese, ice cream, and butter plants, with some adjustment, may be utilized for this purpose. Vehicles for the delivery of milk and dairy products should be decentralized, so that one bomb cannot disrupt the delivery service.

The possibility of sabotage through

TABLE 2

## EFFECT OF PHOSGENE ON SOME FOODS

<i>Food</i>	<i>Effect</i>	<i>Whether Dangerous</i>	<i>Treatment</i>
Flour	Becomes sour and slightly unpalatable. May make a poor loaf	No	48 hours' airing. Can then be blended with 5 parts of undamaged flour and will bake normally
Bread	Outer layers may become unpalatable	No	Cut away outer layers and air remainder
Cereals	Negligible	No	48 hours' airing
Meat and Fish	May become slightly discolored on the surface	No	Condition improved by airing and cooking
Milk	May slightly affect taste	No	Bring to boil
Eggs	None	No	...
Cheese, Butter, Margarine, and Fats	May bleach slightly on surface	No	If bleached, cut away affected part, which may be used for cooking. Remainder is edible
Dried Fruits	Slight loss of palatability	No	Air and cook
Fresh Fruits	Almost none	No	Air and peel off skin or outer layer
Fresh Vegetables	Green vegetables may be slightly bleached	No	Air and cook
Tea, Coffee	May become bitter and unpalatable	No	None is effective, but such material might be used for blending

the milk supply should not be overlooked. Milk is subject to pollution from its source to the consumer. Pasteurization protects against all forms of vegetative bacteria, the group that includes most of the disease producing organisms. Adulteration and contamination of the milk supply following pasteurization should be guarded against.

Milk truck drivers, employees of milk plants, and even delivery men, should be thoroughly investigated as to loyalty. Riders or hitch-hikers should not be permitted on milk trucks. Covers on milk tanks and trucks should be sealed and rigidly inspected. Milk absorbs some gases, and an exposed milk supply will probably have to be destroyed after a gas attack. Bottles or paper containers for milk are effective protection as long as they are tightly sealed.

The use of paper containers for fresh milk has the advantage of conserving space and weight. Twelve quarts of milk in glass bottles weigh approximately 60 pounds. The same milk in paper containers weighs only 25 pounds and occupies about half of the space required for glass containers. This is an important factor in the rubber tire shortage and the consequent food delivery problem.

The War Production Board has restricted the use of tin to about 50 per cent of its normal consumption. The canning industry will reduce the probable consumption of tin by about 50 per cent. There were on hand in this country, at the end of 1941, about 140,000 tons of tin. Our importations from South America are normally about 18,000 tons a year, plus 11,000 tons from Africa, and it is expected that the tin salvage campaign will result in the production of about 6,000 tons a year. The normal consumption of tin is about 70,000 tons a year (although we consumed more than 110,000 tons in 1941), but by economical use and new methods

this may be reduced to 50,000 tons or less a year. The electroplating process, to take the place of the dipping process eventually will reduce tin consumption in the tin plate industry to about one-third of the former rate. Electroplated cans are good for approximately two years with most products, except in extremely warm climates. Any product with a pH above 5.0 needs no tin.

The use of glass containers is being expanded as far as possible, but they are not suitable in all cases because of the expense involved, the use of critical materials, and the shortage of rubber for jar rings, though plastic rings are coming into use to a certain extent. The dehydration of foods is being largely expanded. The principal drawback is the product's lack of appeal. An educational campaign is needed before consumers will be willing to buy products differing so much in appearance from the fresh or canned foods to which they are accustomed.

The use of containers for military purposes is greatly increasing. Practically all foods shipped to the armed forces must be protected with metallic containers because of rough handling, extremes of temperature, vermin and weevils. Sugar and flour, normally placed in bags, have to be encased in metal containers for use in the tropics.

The use of large containers for products which have to be sterilized in the container is extremely difficult because of the length of time required for proper heating. It is possible to bring a normal can to a uniform temperature of 240° F. in a few minutes. The same product in a large container holding as much as 10 gallons would require 16 hours of heating.

The milk industry uses an enormous number of cans for the condensed and evaporated product. There is an increasing tendency toward the substitution of dried milk, which may be packed in metallic or non-metallic containers.

There may be consumer resistance to dehydrated milk as to other dried foods. The protective problem is the same as for other packaged foods.

#### CONCLUSION

Public health people are facing many problems resulting from the war. The war is only one of the emergencies with which we may be faced, but it is probably the most extensive, affects the most people, and is the most prolonged of any emergency we can anticipate.

The shortage of certain materials and of personnel has resulted in extensive substitution of foods, containers, and

processing methods. Inspection is difficult because of limited personnel.

The water and food industries are facing unprecedented emergencies, and public health people should be prepared to meet these emergencies when they arise.

Let's not be caught with our water plants down, and let's keep 'em eating.

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# The Massachusetts Vision Test

An Improved Method for School Vision Testing \*

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THE new vision test recently introduced into the schools of Massachusetts represents an effort to bring screening procedures used in schools more nearly up-to-date and in line with practices approved by leading eye specialists. It was constructed through the coöperative effort of eye specialists and educators working in the schools.

According to descriptions of vision testing programs received from 43 other states,† Massachusetts ranks high among the states recommending comprehensive vision service in the schools. A summary of conditions here, therefore, may not be far amiss in pointing out inadequacies existing generally throughout the country.

The law of Massachusetts covering the vision testing reads as follows:

CHAP. 71, SEC. 57. Testing for Defects—Physical Record. The committee shall cause every child in the public schools to be separately and carefully tested and examined at least once in every school year to ascertain defects in sight or hearing, and other physical defects tending to prevent his receiving the full benefit of his school work, or requiring a

modification of the same in order to prevent injury to the child or to secure the best educational results, and shall require a physical record of each child to be kept in such form as the department may prescribe. The tests of sight and hearing shall be made by the teachers, directions for which shall be prescribed by the Department of Public Health.

CHAP. 71, SEC. 58 (As amended by Chap. 287, Acts of 1935). Furnishing of Test Cards, Blanks, etc. The department (of education), after consultation with the department of public health, shall prescribe and furnish to school committees suitable rules of instruction, test cards, blanks, record books, and other useful appliances for accomplishing the purposes of sections fifty-three to fifty-seven, inclusive, and may furnish said material to such boards of health, as may require it in the performance of their duties. The department may annually expend therefor a sum not exceeding twelve hundred dollars, and shall provide for pupils in the teachers' colleges instruction and practice in the best methods of testing the sight and hearing of children.

The Department of Education, accordingly, has supplied each teacher with a test card and instructions for giving the Snellen test for visual acuity. The record for each child is transferred to his general health record during the first month of each school term and then filed with the superintendent or the school nurse. It becomes the duty of the latter to retest all children who fail the test as given by the classroom teacher. Such failure, if corroborated by the nurse's retest, results in notification to the parents and the suggestion that the child be taken to the family eye specialist. The plan was well con-

\* The material of this paper is based upon a study conducted by a staff composed of the following members of the Massachusetts Department of Public Health: M. Luise Diez, M.D.,† Division of Child Hygiene; Albert E. Sloane, M.D., Consultant Ophthalmologist; Lura Oak, Ph.D.; John W. M. Rothney, Ed.D.; Miriam Forster, M.A., and Philip W. Johnston, Ph.D. The work was made possible by a federal grant to the Division of Child Hygiene.

† Deceased.

‡ Received in reply to a questionnaire sent out to all state departments of health. Eleven questions were submitted which were designed to cover contemporary school vision screening practices.

ceived and, on the surface, may appear to take care of the matter. Actually, the practical working out of these provisions has fallen far short of meeting the needs of the children.

The breakdown in the Massachusetts plan appears at four points: (1) failure of those giving the test to conduct it properly; (2) lack of resources for providing follow-up examinations and treatment, especially in underprivileged communities; (3) the inadequacy of the Snellen test, alone, as a test of visual function; (4) the fact that direct or indirect financial interests of some eye specialists interfere with honest professional service to the children.

During the course of our 3 year study of school vision testing it was possible to observe at first-hand the operation of the program in this state, and also to carry out certain minor investigations subsidiary to the main survey\* being made. Those directing the study within the schools included an ophthalmologist and two educational psychologists.

By visiting classrooms while the regular vision test was being conducted, it could be observed that memorizing of the chart by the children was a common practice which some teachers failed to observe. Children were seen to take the test as though reciting a section of the alphabet and probably without any idea that they were cheating the record. Among the younger children the idea uppermost appeared to be to simulate the illiterate symbol (E) with hand movements. They were intrigued with hand-turning rather than with revealing what they could see on the chart at 20 feet. Often these youngest children were observed to practise near the chart. Upon the subsequent test by the teacher they were merely recording a practised hand exercise which might be executed

without the necessity of seeing all of the symbols. A 15 year old boy who had become sightless in one eye, yet had had a passing record for that eye on his health card each year, proved to us that he could still say the test "by heart" as he had learned it at 6.

The responsibility for such mistakes rests with the individual teacher or nurse giving the test, though it should be noted that the small chart in use here for several years, with a maximum of six test units for each rating, would probably become familiar to any intelligent child after a few repetitions. Skipping and reversing the sequence, however, probably lowers the chances of memorizing. Obscuring the card from all except the one being tested also reduces the chances of error in the record. These precautions were observed by some of the teachers.

Another unfavorable feature noted in many classrooms was unsatisfactory lighting. A 20 foot distance was usually marked off with a view to space and convenience and all testing was subsequently done at this spot. Lighting, glare, or shadows received only secondary attention, regardless of how these varied with weather and time of day.

In studying the validity of the tests as they are generally given, a random selection of 368 Snellen test records made by 50 teachers was compared to the Snellen test records for the same children (ages 8-13) made by our staff ophthalmologist.† The two sets of records for visual acuity were found to correspond in 237 cases (64 per cent) and to disagree in 131 cases (36 per cent). In this and other comparisons made during the course of the study the discrepancy between such records indicated that the tendency of error was

\* This was an investigation into the causes of early school failure through a study of handicapped children in selected areas of the state.

† The comparison of such records in so far as they indicate that the teachers' findings are inferior is based upon an assumption of perfection in the experts' record, a result which may be only approximate for any given examiner.

toward a lower rating (indicating lowered vision) in about two-thirds of the cases and toward a higher rating in one-third of the cases in which a disparity between records occurred. The practical interpretation of these findings suggests that, while some children are sent needlessly to the family eye specialist, a number with lowered visual acuity are being overlooked.

By means of a similar comparison between the Snellen records of a single teacher with special aptitude and skill in giving the tests and records of the staff ophthalmologist for the same children, the importance of individual differences among teachers is suggested. For example, in the case of one of the more capable teachers who had given the Snellen tests to all children (294) throughout a school, there was agreement with the specialist's findings in 230 cases (78 per cent) and disagreement in 64 (22 per cent).

Conclusions to be drawn from our observation of school testing by the teachers and a study of records may be summarized as follows:

1. The Snellen test as used by teachers at present is but a coarse screen for sorting out some of the children who need an eye specialist's attention.

2. The validity of the test may be increased through the selection and training of qualified persons.

3. The reliability of records could be increased by improvements in materials and methods with a view to minimizing opportunities for memorization.

4. Calibrated standard illumination upon the charts should also result in more accurate records.

The school nurse in Massachusetts holds an important place in the vision testing program. Frequently, the superintendent gives her complete responsibility for supervising the initial testing by the teachers, for giving retests to those who fail, and for checking the notices to parents in cases where the attention of the family specialist is

indicated. Many superintendents and some nurses have expressed the belief that vision testing is the province of the health division, including the school nurse. Where such conclusions had been made it was usually observed that the personality of the nurse, her effectiveness in parental contacts, and the limits of her pupil load were so combined that she could undertake the vision work without jeopardizing other duties. The practice most commonly observed throughout the state was the routine testing of all children by each teacher and the retesting by the school nurse of all who had failed.

Among school nurses, as among teachers, a wide range of individual differences appears in the administration of duties in the vision program. The extremes show, on the one hand, instances where only casual effort is made and, on the other hand, the work of the highly efficient nurse who sees to it that each referred child is carefully retested and, when the records indicate, receives the needed ocular attention.

Our close contact in the schools during the 3 year period led us to note certain shortcomings in service rendered by some school nurses. The following summary presents a composite of factors which need correction here and there, rather than a fair commentary upon practices in general.

1. Nurses do not always distinguish between the results of a screening test and a professional diagnosis. Parents, therefore, have been confused and often needlessly annoyed. Notices to parents regarding failure on a vision test should be free of suggestion that the child needs glasses. Diagnosis should always be left to the specialist. The implication of the notice to parents, whether written or verbal, should be: In our school vision test your child did not make a perfect score. In order to make sure that his vision is normal or that any deficiency may be corrected, will



you please have his eyes checked by your family specialist.

2. Nurses, themselves, are frequently uninformed regarding the nature of a specialist's service. The wearing of glasses does not necessarily mean that the child's problem is finally solved. In many cases a child wearing glasses should return frequently to the specialist to be rechecked. The appearance of symptoms in a child, even if his glasses are new, should be an indication to refer him again to the specialist unless it is known that the latter is aware of the symptoms and disregards them in that case.

3. While nurses may not recommend specialists to the parents, they may suggest that the family physician be consulted for the name of a qualified eye specialist. Lacking such guidance, numbers of parents take their children to department store counters where glasses are bought as hair ribbons or tooth brushes are bought. Others are supplied from discards found around home. Frequently the spectacle merchant with the biggest sign or window display attracts the majority of those who are seeking professional services without understanding or guidance.

4. Nurses should inform themselves regarding the professional services available to their communities and assist in efforts to encourage high standards. The earmarks of good service for children are to be found, not in the kind of letters at the end of the specialist's name, nor in office equipment, window or sign displays. They can be judged to some extent by a knowledge of the length and thoroughness of his special professional training, the sincerity and honesty of the specialist as known to those who have availed themselves of his service, and also the particular interest and skill revealed by him in understanding and handling children. Nowhere is the personal equation of greater significance. The younger the

child, the greater is the importance of a patient, sympathetic manner on the part of the examiner.

Until such a time and means can be found for a complete ocular examination by a qualified specialist for each child, the measures to be taken by the school will fall short of satisfactory solution. Non-specialists, such as nurses and teachers, should not be expected to make a diagnosis. No instrument or set of tests based upon the child's subjective reactions should be counted upon to yield perfect results. At best, the school test should detect all who need ocular attention, including the "border-line" cases.

In this connection, it should be mentioned that wide differences exist in the practices of individual specialists and that variance in standards for prescribing glasses reflects upon the efficiency of the school test in any given community. For example, if the school test should be designed to sort out children with a refractive error of, say, one and a half diopters of hypermetropia (farsightedness) and such children are referred to a specialist opposed to fitting children of young age for this degree of simple hypermetropia, the school test may come into disrepute among the specialists and the parents of children so referred. If, on the other hand, the same test is used in a community where the specialists are inclined to prescribe glasses to certain children for this degree of refractive error, the test is credited with higher accuracy. Some specialists prescribe treatment for all so-called borderline cases, while others decline to fit any of them. The relative accuracy and the popularity of a school vision test are found to rest to a considerable extent upon the professional philosophy of local specialists.

The watchword for those seeking to improve the school's effectiveness in keeping check on children's eyesight may well be phrased in the familiar

words of Sidney Webb: the *inevitability* of *gradualness*. Education of the public, insistence upon standards of service, and conscientiousness in the use of improved materials to the end that greater improvements will result—these are the objectives of public health minded individuals everywhere.

The new Massachusetts Vision Test\* now available for general use is designed to meet the need for improved procedures which will bridge the gap between present inadequate provisions and the time somewhere in the future when the eyes of all children will be examined by a qualified eye specialist. It was developed after a 2 year study in which over 6,000 children were tested and checked against an ophthalmologist's examination.

The administration of the test requires an average time of  $2\frac{1}{2}$  minutes for children 8 years of age or older. Slightly longer time is allowed for those who are younger. The same test (with only a change in one item) can be used for all children from 5 to 18 years of age. Anyone accustomed to working with children can successfully administer the test by reading the instructions and practising the routine four or five times.

The test kit can be purchased in carriers if the portable feature is desired.

It consists of the standard Luckiesh Moss Illuminator\*; the improved form of the Snellen Test card; a house chart mounted on a frame with an electrical unit and light source; a near phoria tester, also with an electrical unit and light source; spectacles with plus sphere lenses, others with Maddox rods; and a central switch for controlling the lights.

In addition to the usual test for visual acuity, the series also provides tests for latent hypermetropia and for muscle imbalance.

After 2 years of use in many school systems throughout the state, the consensus of opinion among eye specialists and school departments is generally very favorable toward the test as a whole. The additional features are usually recognized as significant improvements. In a few situations, however, where the local eye specialists are skeptical about testing for any condition except visual acuity, there is considerable lag between the numbers screened (roughly 35 per cent) and those receiving correction (20 per cent).

If the form of the new test results in lively controversy over the innovations this is to be welcomed, since the result is heightened interest in problems of school vision testing and a broader education for all who are concerned in its solution.

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\* Distributed by Welch-Allyn Company, Auburn, N. Y.

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# Field Equipment for Food Inspectors

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THE scope of activities of the food inspection staff of the Baltimore City Health Department has been greatly extended during recent years. This was done largely by providing the inspectors with improved testing outfits. The new outfits make it possible to sample materials more efficiently and permit a variety of chemical testing during the course of inspection. In this way a considerable reduction is effected in the number of samples which otherwise would have been submitted to the Bureau of Laboratories of the department. Moreover, the removal of hazardous chemicals and spoiled food from food establishments is greatly expedited. It is the purpose of this paper to describe the methods and equipment used by food inspectors of the Baltimore City Health Department for making some analytical examinations in the field.

## FIELD EQUIPMENT

Each inspector has a convenient leather case (Figures 1 and 2) which contains the usual detention cards, violation notices, copies of laws, educational forms and leaflets, sample identification cards, and such conventional equipment as flashlight, thermometer, can opener and meat trier. Paper bags and paper spoons are carried for collecting food samples; sterile 4 oz. bottles for water samples, and sampling vials for food utensil swabbing. Portable apparatus is also provided for the detec-

tion of fluorides, cyanides, cadmium, arsenic, and sulfites; equipment is included for testing the strength of chlorine solutions used as disinfectants and for the detection of spoilage of shucked oysters and crab meat. Wherever possible, testing materials are contained in uniform glass vials and each case is fitted with a wooden rack to hold the apparatus. All solutions, test papers, and other equipment are periodically replaced and reconditioned by the Bureau of Laboratories.

## ANALYTICAL PROCEDURES

### 1. *The Detection of Spoilage of Shucked Oysters—*

The usefulness of pH measurements of oyster liquor as an adjunct to organoleptic examination in the detection of spoilage of shucked oysters has been demonstrated by several investigators.<sup>1,2</sup> The pH of fresh shucked oysters varies between 6.0 and 7.0. A pH value of 5.4 to 5.8 is regarded with suspicion, while values below this range are indicative of decomposition. A convenient field examination is made by transferring 5 ml. of oyster liquor to a test tube graduated at 5 ml. and adding 0.5 ml. of methyl red indicator solution (0.02 per cent methyl red in 50 per cent alcohol). After mixing, the color produced is compared with the methyl red color standards in sealed glass ampules. Standards reading pH 5.4 and 6.0 are provided. If there are indications that

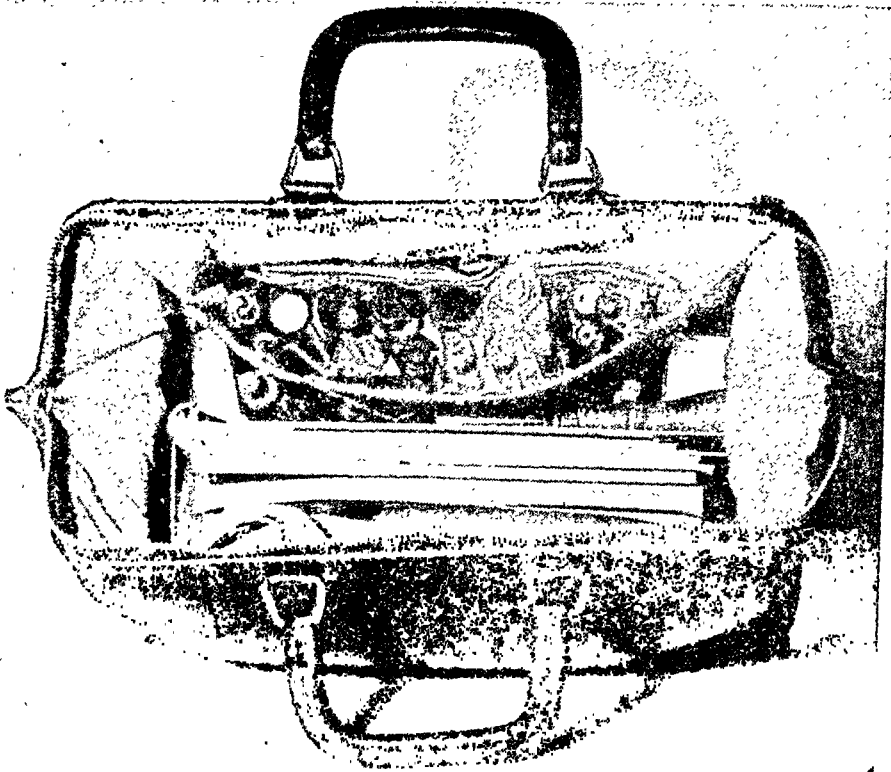


FIGURE 1—Leather case containing equipment

the oysters have been recently washed, several drops of the indicator solution are placed directly on the oyster. The production of a persistent red color indicates spoilage.

## 2. *The Detection of Spoilage of Crab Meat—*

The decomposition of crab meat involves a progressive proteolysis, accompanied by a rapid rise in the ammonia

FIGURE 2

## Food Inspector's Field Equipment



content of the meat. In 1932 Harris<sup>3</sup> proposed the Nessler ammonia test as a means of differentiating fresh from spoiled crab meat. The test used by our inspectors is done in this manner: About 1 gm. of crab meat is transferred to a test tube and shaken with several ml. of water, and 2 to 3 drops of Nessler's reagent are then added. The immediate development of a deep yellow or brown color indicates spoilage of the meat. The test is used only as an aid to organoleptic examination of the suspected crab meat.

### 3. *The Detection of Cyanide in Metal Polish—*

In 1930, Williams<sup>4</sup> pointed out the possible rôle of metal polish which contained cyanide in cases of gastroenteritis. In 1938 the Maryland State Department of Health adopted regulations governing the retail sale or use of cyanide containing preparations. Many other communities have similar legislation.<sup>4</sup>

The qualitative detection of cyanide in metal polishes in the field may be conveniently made with sodium picrate test papers.<sup>5</sup> This test paper is moistened with water and is then suspended in the container of the suspected polish. Care is taken that the paper does not come in contact with the material. The paper turns orange and then brick red in 5 to 10 minutes if the concentration of cyanide (as KCN) exceeds 0.5 per cent. Although the reaction is not wholly specific for cyanide, the method serves as a ready screening test in the field.

### 4. *Cadmium—*

Because of the difficulty in obtaining aluminum and stainless steel there has been a tendency on the part of the equipment manufacturing companies to use cadmium for plating utensils and equipment. A number of food poisoning outbreaks attributed to the consump-

tion of acid foods stored in cadmium-plated vessels have been reported.<sup>6</sup> Warnings of the dangers of the use of cadmium-lined utensils have been issued to the newspapers by the Federal Security Agency.

A simple testing unit to detect cadmium during the inspection of food establishments in Baltimore was devised.<sup>7</sup> The outfit consists of two small vials. One contains strips of filter paper which have been impregnated with a 20 per cent sodium sulfide solution and dried; the other contains small cotton swabs immersed in 10 per cent nitric acid. The swab is rubbed on the suspected metal and is then applied to the sodium sulfide paper which has been previously moistened with water. The instantaneous appearance of a canary yellow stain on the paper indicates the presence of cadmium.

### 5. *Available Chlorine in Disinfectant Solutions—*

Regulations of the Maryland State Board of Health require that all food containers (drinking glasses, plates, forks, etc.) used in establishments dispensing food or drink, after cleaning and rinsing, must be disinfected either by immersing in water at 180° F. or above, or by immersion in a solution containing not less than 100 p.p.m. of available chlorine.

The strength of chlorine rinse waters is determined by a modification of the orthotolidine test.<sup>8</sup> Inspectors carry a 2 oz. dropping bottle of orthotolidine solution, a 100 p.p.m. permanent chlorine standard in a sealed ampule, a test tube of the same diameter as the standard and graduated at 10 ml., and a medicine dropper calibrated to deliver 20 drops of water per ml. Ten ml. of tap water are added to the tube, followed by 4 drops (0.2 ml.) of the rinse water under test, and 1 ml. of the orthotolidine solution. After 5 to 10 minutes, comparison is made with the standard.

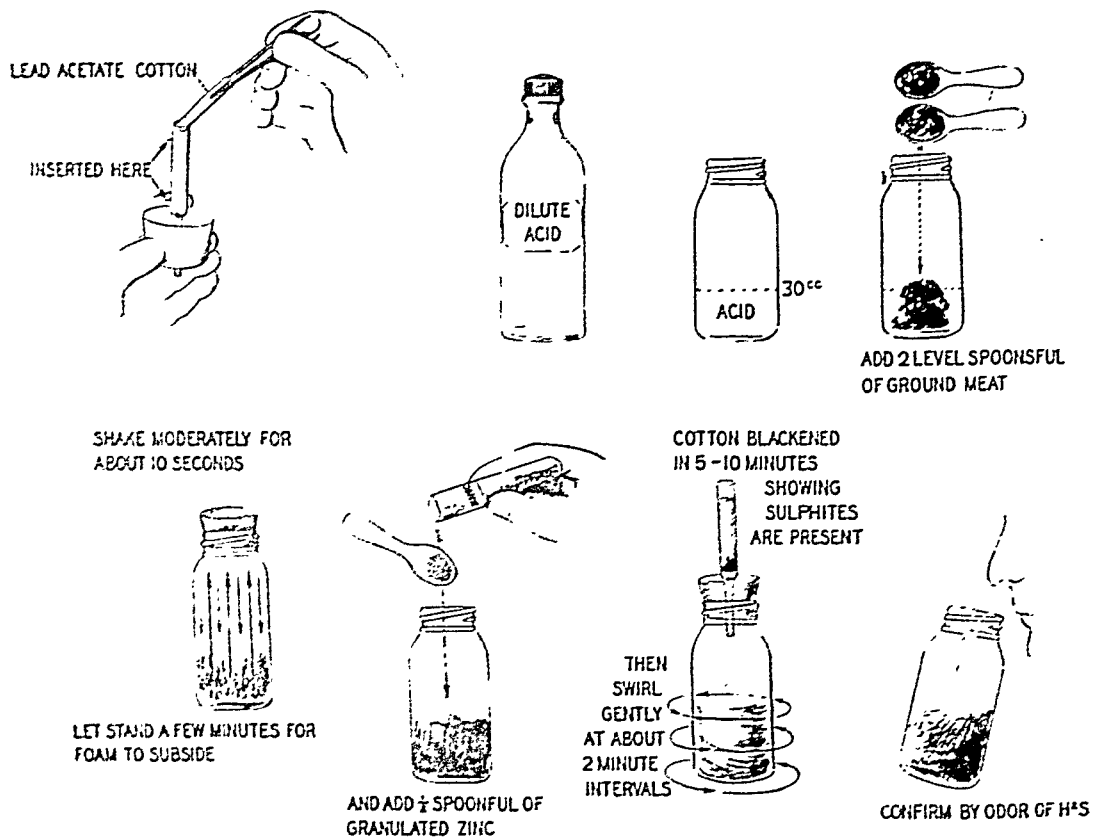


FIGURE 3

utes the bottle may be opened, when there will be a decided odor of hydrogen sulfide if sulfites are present. The test will detect as little as one grain of sodium sulfite in a pound of ground meat. Traces of sulfides in foods may yield false positive tests, and because of this the outfits are intended for screening tests only. All samples which show positive reactions are submitted to the laboratory for confirmatory analyses.

#### 5. Arsenic Spray Residue—

The presence of excessive amounts of arsenic spray residue on fruits and vegetables is suspected when there are unusual deposits on the foods. In order to eliminate the detention of truck, boat, or railroad shipments pending laboratory examination, testing for arsenic is done in the field. The test used is an adaptation of the official Gutzeit method for arsenic of the A.O.A.C.<sup>14</sup>

Similar modifications have been used by others.<sup>15</sup>

The equipment designed for the sulfite determination in ground meat is also used for the arsenic tests. A piece of glass tubing is fitted to the Gutzeit scrubber tube to hold a strip of sensitized mercuric bromide paper. In addition, 15 ml. of 40 per cent stannous chloride solution is added to each liter of the 10 per cent sulfuric acid reagent. In practice the acid used for the sulfite test contains the stannous chloride addition and is thus also suitable for the arsenic examination. The details of the tests are indicated in Figure 4. The directions are essentially the same as in the case of the sulfite examination. Scrapings of suspected material are introduced into the generator. The acid and zinc are added and the reaction is allowed to proceed for 30 minutes. A decided yellow to dark brown color-

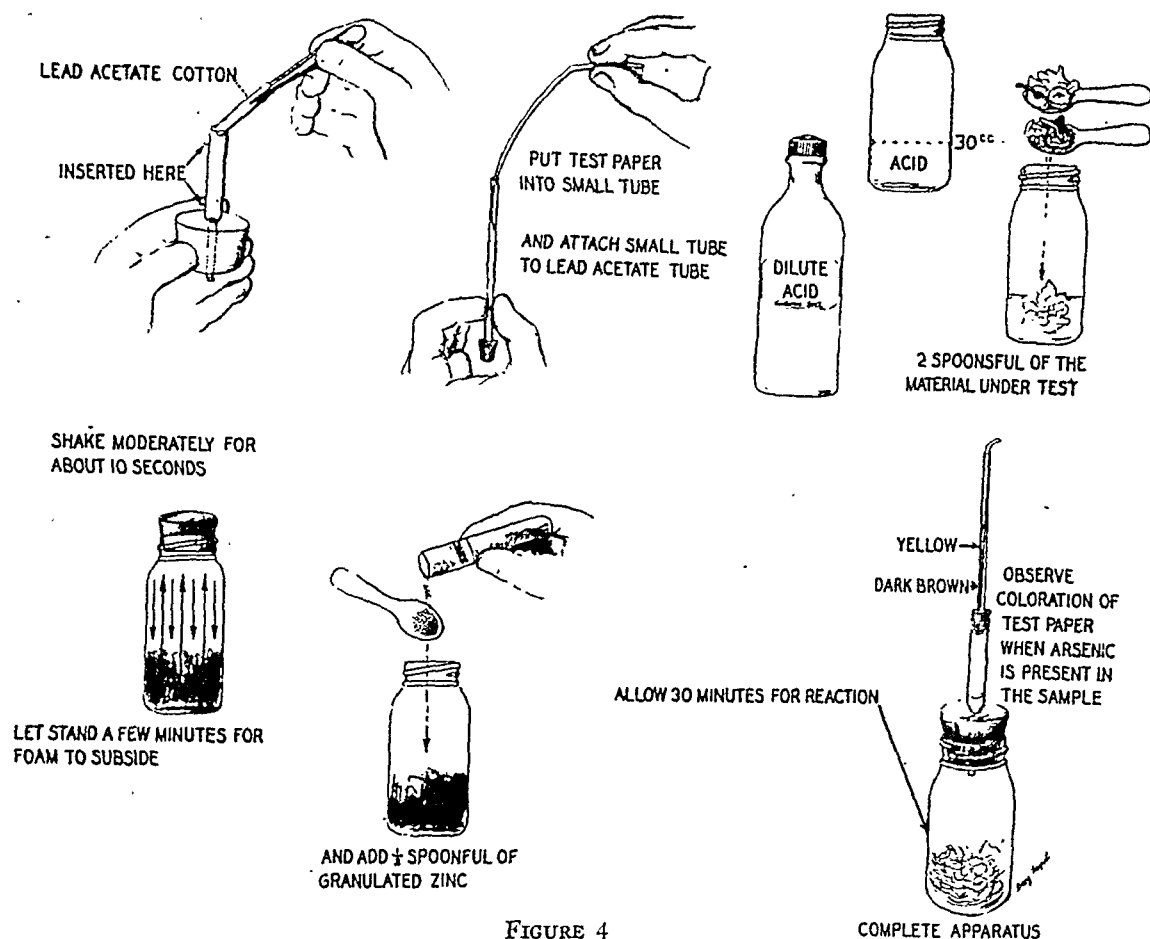


FIGURE 4

tion of the sensitized mercuric bromide paper indicates the presence of arsenic.

#### 9. Food Utensil Swabbing—

The improved vials recently described by Buck<sup>16</sup> are routinely used by the Baltimore City Health Department food inspectors to secure bacteriologic samples from drinking glasses and food utensils. The vials have a plastic screw type closure which holds a wooden applicator with cotton attached. Salt solution or broth is sterilized directly in the vials. It is possible for the inspector to carry a number of these small vials in his carrying case without fear of contaminating them.

#### 10. Other Tests—

Other equipment may be added to the inspector's carrying case as needs arise, as for example, the Scharer modification of the phosphatase test for the

detection of proper pasteurization of milk and cream<sup>17</sup> which is adapted to field use. Soft drink bottling plant inspectors may use an outfit for testing the alkalinity of wash waters. The foam test<sup>18</sup> for renovated butter and oleomargarine may be carried out in the field by means of a spoon and an alcohol lamp.

#### DISCUSSION

More than 6,000 field tests have been made by the staff of the Bureau of Food Control of the Baltimore City Health Department during the past two years. The majority of these tests were examinations of chlorine rinse waters and food utensil swabbings. Other tests revealed that metal polish containing cyanide was in use in more than 200 food establishments, which led to regulations prohibiting its use. Field testing resulted in the condemnation of at least

50 lots of incipiently decomposed shucked oysters which could not have been readily detected by organoleptic means. Sulfite in ground meat is now rarely encountered, largely because meat dealers know that the Health Department has ready means of its detection.

The field test is never used as a basis for prosecution. The purpose and the intention of the field tests is to assist the inspectors' organoleptic senses and is not meant to supplant the more critical examination of foods by trained chemists. Inspectors are cautioned to use the field methods for information and screening purposes only and to submit samples to the Bureau of Laboratories for confirmatory analyses.

#### SUMMARY

A description has been given of the methods and equipment used by food inspectors of the Baltimore City Health Department for making selected analytical examinations in the course of inspections of food establishments.

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# Trends in Public Health Activities among Negroes in 96 Southern Counties During the Period 1930-1939

## II. Comparison of Certain Health Services Available for Negroes and White Persons

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THE Julius Rosenwald Fund in the summer of 1940 made available a grant to the College of Medicine of Howard University for a 3 months' study of the trend in public health activities in relation to the Negro in the United States, which had taken place during the decade 1930-1939. In formulating the protocol for this investigation, an inquiry into the health situation among Negroes in the rural South was given a prominent place, since the Negro health problem, if there be such, is to be found primarily in the rural South. Therefore, letters and questionnaires were sent to 385 southern counties having full-time health units. The schedules requested information along these lines: first, Negro professional personnel employed; second, availability of certain health services according to race; and third, the personal reactions of the administrators of these health units to certain questions of opinion.

The analysis of the first of these three areas of investigations has already been published.<sup>1</sup> The present article is concerned with the second phase; namely, the trends in the availability of certain health services for Negroes as compared with whites during the decade 1930-

1939. The last of these analyses will be the subject of a subsequent paper. For a fuller discussion of the characteristics of the 96 counties studied, the reader is referred to the first article, since only one or two pertinent items which will serve to orient him will be mentioned here.

One hundred and seventeen, or 30.4 per cent, of 385 counties responded. However, of this number, 21 had to be discarded for failure to answer the questionnaire. Thus 96 counties, or 24.9 per cent, provided us with schedules which in part or as a whole could be used in this report. The distribution of these counties according to state is shown in Table 1. It is noted that Alabama had the largest representation of counties, with 24, followed by Florida, Louisiana, and Tennessee, with 10 each. Texas, Arkansas, and West Virginia are the only states not represented. Three counties responded from Texas but were not included because of the inadequacy of the information recorded. No questionnaires were received from Arkansas, while West Virginia was not circularized because of the small Negro population, which comprises only 8 per cent of the total in the state.

TABLE 1

*Distribution of 96 Counties According to States*

<i>State</i>	<i>No. of Counties Responding</i>
Alabama . . . . .	24
Florida . . . . .	7
Georgia . . . . .	10
Kentucky . . . . .	6
Louisiana . . . . .	10
Maryland . . . . .	6
Mississippi . . . . .	5
North Carolina . . . . .	7
Oklahoma . . . . .	1
South Carolina . . . . .	6
Virginia . . . . .	4
Tennessee . . . . .	10
Total . . . . .	96

The 96 counties had a total of 3,765,183 population, of whom 1,371,572, or 36 per cent, were Negroes. This represents about one-tenth of the whole Negro population and one-seventh of that of the South. Hence, this sample is large enough to be somewhat representative of this section of the South. The population was largely rural, since only 16 of the 96 counties reported city-county organizations. The largest of these combined units was Jefferson County, Ala., which includes Birmingham within its boundary and gives this county a total population of 475,000 individuals, of whom 184,795 are Negroes.

#### COMPARISON OF CERTAIN HEALTH SERVICES AVAILABLE FOR NEGROES AND WHITE PERSONS

Unfortunately it was impossible to obtain enough information on all of the

health activities investigated from a sufficiently large number of counties to be representative at all times of this group. This is due to the fact that for the most part these health units do not tabulate much of their essential data according to color. This is to be regretted because this is one of the methods which help the health officer or any investigator to determine whether or not services are being made available or used according to the needs of particular groups in the population. Even though the limitation of the data must be kept in mind, yet certain trends may be observed. Furthermore, the paucity of material in certain spheres is an excellent argument for urging better collection and tabulation of the data which are daily gathered by health departments.

1. *Tuberculosis* — Tuberculosis at present is the seventh or eighth cause of death among whites, while it is first or second among Negroes. Therefore services should be developed in a larger measure for Negroes. This, however, does not seem to be the case.

Clinic facilities are an essential part in the tuberculosis case finding program and constitute a bulwark in the first line of defense against the disease. What has been the progress in this direction during the period 1930-1939? Table 2 provides the data for such a discussion. This table is arranged so that it presents in the first two horizontal tabulations a comparison of 17 counties which reported information for

both 1930 and 1939; while the last horizontal division considers all of the counties which recorded information for 1939, irrespective of whether or not they provided such data for 1930.

It is readily noted when the 17 counties are compared for 1930 and 1939 that in both periods the availability of clinic services for white persons was much greater than for Negroes, although the number of deaths was greater in the latter group. In 1930, Negroes scarcely received 1 clinic hour per week per 100 deaths, while the white population had almost 5. In 1939, the services increased for both groups, although much more for the Negro, so that the disproportion was cut in half, making this 2.5 to 1. Even though there was a growth in this sphere, yet there were a number of counties which still provided no clinic services. In 1930, of the 17 counties, 10 were deficient in this regard, while in 1939, 8, or 50 per cent, still reported this lack. When all of the counties with data for 1939 are considered, the picture changes very little. It is still found that 18, or half of the counties, had no clinic services either for Negro or white individuals. Although this is a relatively small sample, the fact stands out that Negroes are at present receiving less clinic service and there are still many counties without any services whatsoever.

The outlook is not much better when hospital facilities are evaluated. Here again, the condition in 28 counties which reported for both 1930 and 1939

may be studied in Table 3. As would be expected, the number of beds for white persons was greater than for Negroes in both 1930 and 1939. In the former year the 28 counties reported 0.08 beds per death for Negroes as compared to 0.18 for white persons while, in 1939, this had increased for both races, but the disproportion of two to one was still in the Negro's disfavor. Furthermore, neither for the white nor the Negro population was the minimum standard of one bed per death reached. It is also of interest to note that of the 28 counties, 25 in 1930 had beds neither for white persons nor Negroes, while in 1939, the picture had changed very little, so that 20 still reported no hospital facilities. When all of the counties which reported for 1939 are considered, the picture is somewhat more favorable, particularly for white persons, where the minimum of 1 bed per death appears to have been achieved; but for the Negro the situation is still of concern, since less than one-half a bed is available. It is to be noted also that, of the 61 counties, approximately 40, or two-thirds, reported no hospital facilities for either race.

It is beyond contradiction on the one hand to say that progress in tuberculosis control has taken place in the rural areas during the period of 1930-1939 and, measured statistically, this has been a two- to threefold advance. On the other side, however, it must be admitted that, in spite of too meager facilities and services, the tuberculosis deaths in many of these areas have con-

TABLE 3

*Availability of Beds for Tuberculosis Care*

Year	Counties Reporting	No. of Deaths		No. of Beds		Beds per Death	
		N	W	N	W	N	W
1930	28	517	358	40	60	0.08	0.18
1939	28	376	266	80	129	0.21	0.48
1939	61	682	470	279	547	0.40	1.16

tinued to decrease and that, as a whole, the Negro rates for the South are much lower than those for the North. The causes of this downward trend and this differential are not known, and it might well be of some interest to develop mass surveys in selected rural areas to gain a true insight into the tuberculosis problem among rural Negroes, just as has been done for syphilis.

2. *Venereal Diseases* — The Negro seems to fare somewhat better in the programs for venereal disease control. Comparing 32 counties in 1930 and 1939 (Table 4), it is found that, on

1930 and 1939; even so, there appears to have been marked progress in this field during this 10 year period. This same advance is of course to be noted when all of the counties which reported data for 1939 are considered. Here, again, the Negroes have twice as many clinic services as white persons. This forward march is also noted from another angle. In 1930, of the 32 counties, 17 did not have any venereal disease clinics for either racial group. In 1939, of the same 32 counties, only 4 reported in the negative. This is even better when all of the 63 counties reporting in 1939

TABLE 4  
*Venereal Disease Clinic Facilities in 1930 and 1939*

Year	Counties Reporting	Population		Clinic Hours per Week		Clinic Hours per Week per 100,000	
		N	W	N	W	N	W
1930	32	421,025	826,535	64	60	15.2	7.3
1939	32	421,025	826,535	269	215	63.9	26.0
1939	63	951,855	1,674,222	519	413	54.5	24.7

the basis of population, the Negro had available many more clinic hours per week than white persons. In 1930, this was 15.2 per 100,000 for the Negro and 7.3 per 100,000 for white persons, or a ratio of two to one. By 1939, these services had increased almost fourfold for both groups, so that Negroes had available 63.9 clinic hours per week per 100,000, as compared to 26.0 for white persons. It must be kept in mind that the gains during this 10 year period may not be quite this much, since the same population totals were used for

are considered, for in this group only 4 had no clinic facilities for Negroes, but 8 had none for white persons.

This remarkable achievement during this decade must be attributed to the tremendous emphasis which has been placed on venereal disease control since 1935. One must not lose sight of the fact, however, that the proportion of facilities is not yet equivalent to the ratio of the venereal disease rate of Negroes to that of white persons. It has often been repeated for instance that six to ten times as many Negroes

TABLE 5  
*Prenatal Clinic Service Available in 1930 and 1939*

Year	Counties Reporting	No. of Live Births		No. of Clinic Hours per Week		No. of Clinic Hours per Week per 1,000 Live Births	
		N	W	N	W	N	W
1930	21	7,545	9,655	13.2	9.3	1.9	0.9
1939	21	7,561	12,731	70.5	60.5	9.2	5.6
1939	42	15,401	21,745	148.5	131.0	9.9	6.2

have syphilis; therefore, a ratio of clinic services of two to one is still far short of the mark if need is the criterion of choice for the development of facilities. Also, it is to be emphasized that, even in 1939, almost 15 per cent of the counties had no clinical facilities for the control of venereal diseases.

3. *Maternal and Infant Care* — The problem of maternal and infant welfare is also of particular importance to Negroes, since their mortalities are generally twice as high as that of white individuals. According to Table 5, wherein 21 counties are compared for 1930 and 1939, it is found that, although Negroes had twice as many prenatal clinic hours per week for 1,000 live births as did white persons, yet the amount was far below the minimum of from 6 to 12 clinic hours per week per 1,000 live births suggested by Hiscock.<sup>2</sup> This was also true for the white population. By 1939, however, there was a sizable increase for both groups in the same 21 counties, so that Negroes received 9.2 clinic hours per week per 1,000 live births, while white persons obtained 5.6. Thus a five- and sixfold increase respectively was achieved for these two races in the decade 1930-1939, and the 21 counties in 1939 had apparently reached the suggested minimum level. This favorable position is also in evidence when all of the 50 counties which reported such services are analyzed. This advance certainly must in part be attributed to the recent stimulation given to maternal and child health programs through federal con-

tributions under the Social Security Act promulgated in 1935. Without such financial stimulation it is to be doubted whether this marked progress would have taken place. Again, a word of caution must be interjected here. In 1939, 16, or about one-third of the 50 counties, reported no prenatal clinic facilities either for white or Negro pregnant women. If this is the situation in full-time county health units, what then must be the outlook in counties with no such organizations?

The proportion of babies delivered in hospitals and by midwives and the number of midwives in the community are also measures of evaluation of maternal and infant hygiene programs. In these spheres the Negro suffers by comparison. In Table 6, the percentages of babies delivered in hospitals and by midwives is considered. Fifty-four, or 86 per cent of the 63 counties, reported that in 1939 less than 10 per cent of the Negro babies were born in hospitals. If this group is further analyzed it is found that 22 of the 54 counties, or one-third of the 63 units, had no Negro hospital deliveries in 1939. For the white population, on the other hand, only 21, or one-third of the counties, had less than 10 per cent of their white babies delivered in hospitals. Of these 21, only 6 counties reported no white hospital deliveries.

It has often been said that the majority of Negro babies in the South are delivered by midwives. This table supports this contention. In 1939, 13, or one-fifth of the counties, reported that

TABLE 6

*Per cent of Babies Delivered in Hospitals and by Midwives in 1939*

		Counties Reporting	Per cent of Babies Delivered in Hospitals					Counties Reporting	Per cent of Babies Delivered by Midwives				
			0-9	10-19	20-29	30-39	40 and Over		0-19	20-39	40-59	60-79	80-100
Number of Counties	N	63	54	3	2	1	3	68	13	3	5	21	26
	W	63	21	15	9	14	14	68	54	9	2	2	1

less than 20 per cent of their Negro babies were delivered by midwives; on the other hand, 80 per cent of the counties stated that this was true for white mothers. Furthermore, 26, or more than one-third of the counties, reported that 80 per cent of the Negro deliveries were attended by midwives, while only 1 county reported such a high percentage for white mothers. This condition is typical of practically the whole South, as shown by the report of the Bureau of the Census.<sup>3</sup>

The number of midwives in these counties is part of the whole picture and may be briefly described. In 1930, 57 counties reported a total of 2,938 midwives; these same counties in 1939 stated that they had only 1,943 of these individuals, or a decrease of more than 35 per cent. Using a population estimate of 943,274, we find that in 1930 there was 1 midwife for every 321 Negroes, while in 1939 this ratio had decreased to 1 per 485. This latter ratio holds true when all of the counties, 89 in number, reporting for 1939 are considered. With a total population in that year of 1,275,830 Negroes, they had 2,772 midwives, or 1 for every 460 persons. During the period 1930-1939, 8 of the 54 counties showed an increase in the number of midwives; 3 remained the same; 43 showed a definite decrease.

Registration and supervision are essential aspects in the program for continuous improvement of the midwife and therefore should be in force in every community. Of 87 counties, 80 have undertaken such a program, but 7 still neither register nor supervise their midwives. Of 71 which have this program of supervision, one-half instituted it during the decade 1930-1939; 3 previous to 1920, and the rest in the decade of 1920-1929.

It appears to us that for some time to come midwives, like poor relations, will always be with us; and certainly in many areas they fill a much needed

gap in the number of professional personnel and the availability of services. This being the case, every attempt should be made by all health units confronted with this problem to develop plans for their improvement. This should be done by supervision, classes, and inspections. In addition, the utilization of trained nurse-midwives will help in supplementing and aiding this service.

4. *School Hygiene*—It was very difficult to analyze the data in this sphere of activity because of the meagerness of the information received. This incompleteness may signify that such programs have not been fully developed and are in the rudimentary stages; or that data separated on the basis of race are not available. The former statement is no doubt the truer explanation, since Negro children, with the exception of mass immunization procedures, are as a general rule ignored in the formulation of school health programs.

The analysis of the data available shows that the health programs for Negro children consist in the main of visits by nurses. In 1930, of 37 counties, 21 reported that 100 per cent of the Negro schools were visited. However, in that year, 8 of the counties reported that Negro schools had not been visited, whereas the number for the white schools was 5. In 1939 conditions were somewhat better, since in 53 of 72 counties all of the Negro schools were visited and, for the white schools, the same held true in 61 counties. The number of counties reporting this deficiency in Negro schools was 5, while only 3 admitted such a lack in white schools.

The examination of school children is an important aspect of this whole program. Within itself it is an important educational procedure. In 1930, 12, or 40 per cent, of 30 counties stated that Negro children were not examined, while only half this number reported the same for white children. The rest of

the counties reported various figures ranging from 8 to 100 per cent. In 1939 some progress is noticed. Eleven of 58 counties reported that no Negro children had been examined, but for the white children only 1 county admitted this deficiency. Thirty-eight of the 58 counties examined 50 per cent or more of their white children, but only 23 reached this level for Negro children.

Dental services which may be considered part of this program show an even greater lag for both white and Negro children. In 1930 all of the 27 counties which reported on this phase admitted no dental services for Negro children. Of these same 27, 3 admitted having services available to white children; 1 had given services totalling 748 items; another relied on the State Health Department trailer, and the third had its own clinics. By 1939 this picture had changed a little for the better. Of 44 counties reporting, 12, or about 30 per cent, provided dental services for Negro school children. These 12 counties which are listed below reported an approximate total number of 5,500 items of service.

COUNTIES REPORTING DENTAL SERVICES  
FOR NEGROES

1. Jefferson, Ala.
2. Orange, Fla.
3. Worth, Ga.
4. Caldwell, Ky.
5. LaSalle, La.
6. St. Martin, La.
7. Anne Arundel, Md.
8. Pitt, N. C.
9. Columbus, N. C.
10. Berkeley, S. C.
11. Hardeman, Tenn.
12. Albemarle, Va.

More services were, of course, available to white children in 1939. Of the 44 counties, 24, or more than 50 per cent, reported dental services for this group to the extent of 30,000 items.

Although progress is shown in the availability of dental services for Negro and white children, yet the amount of

services rendered is still very meager when compared with the total school population of these counties. This is particularly true in the case of Negro children. This problem, like others, needs to be attacked by health departments. The employment of more dental hygienists might partly solve this problem. This professional group could be used for screening children with defects while state or county trailers could engage in the follow-up work. These dental hygienists could also be used effectively for health education. Even though this approach appears quite feasible, nevertheless, there will always be two obstacles to the development of dental programs in schools: (1) the economic position of Negro rural families; and (2) the wide scattering of Negro schools in many rural communities.

*Postgraduate Courses and Fellowships*—An attempt was made to discover the availability of courses and fellowships for Negro personnel in these health departments. As a whole they are not plentiful. In the decade of 1930-1939, of 83 counties only 1 had offered postgraduate courses for Negro physicians; only 1 had done so for nurses, and 6 had offered courses for others; mostly midwives. These counties were more generous in awarding fellowships. Of 84 counties, 5 had granted 8 fellowships to physicians and 6 had granted 7 to Negro nurses.

SUMMARY

Ninety-six southern counties with full-time health units were investigated by the questionnaire method in reference to the progress which had been achieved during the period 1930-1939 in certain public health services available to Negroes and white persons.

The analysis reveals that, during the decade in question, progress has taken place along several avenues, but this has been slow in pace and meager in quantity when compared to the number

and magnitude of the health problems facing Negroes in the rural South. Some advance has been made in the provision of clinic services for Negroes and white persons in these areas, but still too many communities are without adequate clinic facilities. This appears to be true particularly of truly rural counties with small populations. This fact has already been emphasized in a recent study which concluded: "Lack of clinic service to support the educational work of public health agencies is an outstanding deficiency of health organization especially for counties in the lower population group."<sup>4</sup>

Although tuberculosis is the foremost plague of the Negro, yet in this group of counties, he has available less clinic service and fewer beds per death. In the venereal disease field the Negro fares better—most likely as the result of the recent crusade—since he has twice as many clinic hours allocated to him per week as do his white brethren; but even this is not in proportion to the disparity existing between the incidence in the two races. The same outlook is to be found in the maternal and child health sphere. This study showed alarming neglect in the health supervision of Negro school children. In 1939, 11 of 58 counties reported no examination of

Negro school children, while only 1 reported this deficiency for white school children.

On the basis of the analysis and opinions expressed by county health officers one may state that, in addition to the needs of clinic services for venereal diseases, tuberculosis, and the pre-natal and postnatal stages, there is also a dire urgency for the development of a comprehensive approach to the manifold health problems of the Negro. What has been gained, may we ask, in a public health way when it is recorded in the files that a man has received 20 injections of bismuth and 20 of neoarsphenamine, and therefore has been discharged as adequately treated for syphilis, if his nutrition is poor, his teeth are decayed, his health habits are atrocious, he is diabetic, and his house is not properly screened?

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# Evaluation of Health Services in a National Emergency\*

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AGAIN I am back at the scene of my former activity in the public health field. One of my early assignments from the U. S. Public Health Service was to the State of Missouri. That was in the early 20's. In those days the disappointments and failures attending public health work far exceeded the actual accomplishments. Today, coming from Washington, I assume I am privileged to point with pride and view with alarm. I should like, with your permission, to do the former first.

If conditions today were less critical—if I were less actively identified with matters of immediate importance—I should like to spend this time reminiscing. I even believe we might derive some profit from such a backward glance. But reminiscences are hardly appropriate under present circumstances. Nevertheless, before passing on to a discussion of current problems, I should like to say a few words about the past.

When this association was formed, few had any idea that it would develop into the large and influential organization represented here today. At the early conferences, the speakers as well as the audiences consisted mainly of the founding fathers themselves. When compared with the many and complex tasks facing us today, the matters which concerned us then appear relatively

simple. Moreover, resources for public health activities were extremely limited. When I was sent to Missouri, the state biennial budget for such activities amounted to some \$60,000 or \$70,000. Actually, a large part of this amount was collected by the State Board of Health in the form of medical licensure and vital statistics fees, and went back into the state treasury. The board of health was vested by law with broad and equally vague powers and duties, but in fact it was an organization which passed upon applications for licensure and drew up resolutions upon which local governing agencies might act. In addition, it performed the rather prosaic function of collecting records of births and deaths. The local health officer was a part-time official who held nominal office and who was appointed merely in order that the statute might be fulfilled.

My function as a federal official detailed to Missouri was to stimulate a movement for expanded local health organization. I might better say that my function was to explore the basis for such a movement and to seek out the local resources for getting it under way. I did not come as a Santa Claus bearing offerings and material assistance from Uncle Sam, in the manner of federal officials today. At that time my organization, the U. S. Public Health Service, felt it was extending itself to the utmost by sending one young, inexperienced officer to give such advice and moral support as he could. From that point on, the job consisted chiefly of per-

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suasion, of beating the bushes for any and every kind of facility or support, and getting local appropriations.

Since those early days the public health services of this country have been greatly extended and improved. Increasing state and local determination to face health problems effectively has been supported by substantial financial aid from the federal government. Instead of a biennial budget of \$60,000 or \$70,000, state funds budgeted for public health activities in Missouri during the current fiscal year alone amount to approximately \$170,000. This sum is augmented by local funds totaling \$1,073,000. In addition, federal funds budgeted for health services during the year amount to slightly more than three-quarters of a million dollars. Thus, the total annual public health budget in Missouri for the present fiscal year is approximately \$2,031,000.

Missouri has done better than some states and not so well as many others in contributing to its own development. The health organization of the country as a whole is still highly uneven. Of the 3,070 counties in the United States, 1,669, or about 54 per cent, were organized under some form of full-time local service on June 30, 1941. For the most part, these organized counties are the populous ones; therefore the proportion of the population served is much greater than the proportion of jurisdictions involved. Since June 30, 1941, full-time service has been extended to more than 100 additional counties. The total coöperative health budget for the fiscal year 1942, including federal, state, and local funds, as reported to the Public Health Service, is almost \$119,000,000.

Of course, there is room for a great deal of improvement. The fact that more than one-half of our counties are covered by full-time local services conveys a mistaken impression unless it is pointed out that in many counties only

limited services are performed by skeleton organizations which may be said to have little muscle covering the bones. But this is no time to recount past successes and failures. Nor is it a time to plan for the future in terms of the progressive evolution which has characterized the development of most of our American institutions.

We are now engaged in a no-quarter battle with an enemy who scorns these institutions and who is doing the utmost to insure that they will play no further part in world history. Whether we win or lose depends upon how quickly and effectively we can organize the entire nation with all its resources and skills for one supreme, coöordinated victory program. The public health organizations of this country can no more escape the consequences of this total mobilization than can any other segment of national life. It is true that health services must be extended to many regions which formerly had few inhabitants but which are now teeming centers of military or industrial activity. But a more immediate responsibility, and one which has even greater bearing on the future of our country, is the fullest possible utilization of the public health structure now existing in the more populous sections of the nation.

This means that health departments must subject every aspect of their programs to scrutiny in terms of war-connected need. Cherished plans may have to be given up, and projects which cannot be justified directly as war measures may have to be abandoned. Accustomed ways of doing things will have to be altered so that things can be done quickly. I do not need to tell you how late we are as a nation in getting this type of conversion under way. The reverses suffered by our armed forces and those of our allies is ample evidence of our tardiness.

While curtailment of certain activities will be necessary, prompt and vigorous

undertaking of many new activities is imperative. I believe it is correct to say that no other type of agency is better adapted organizationally and legally to the assumption of these emergency duties than the health departments. A declaration of the American Public Health Association, adopted in December, 1941, states:

"The effective modern health department, as now conceived and at present organized in many states, cities, and counties as a branch of civil government, comprises a medical, sanitary, and related biological and social competence which enjoys broad authority to meet a wide variety of medical and environmental emergencies. . . . the health officer and his staff must be alert to extend, and, if necessary, to modify the usually accepted health functions to meet the multitude of exceptional situations certain to be created by the state of war and by the mobilization of all the people and their industry to support the armed forces."

This is a call for direct action, for the assumption of larger responsibilities, and for greater vigor in all essential activities. In recent years, health departments have sought to accomplish results chiefly by means of persuasion. Such a method may have been appropriate when we could afford to proceed on the assumption, however fallacious, that people had only to be told what to do and that somehow or other the wherewithal to do it would be forthcoming. The time when we could proceed on such a basis, however, is gone, and it may never return—at least not in our generation. Today, direct administrative action is required; the processes of education are too slow. Free enterprise cannot be expected to adjust itself automatically to a situation which is national in scope and character, or to undertake on its own initiative action which does not serve its own immediate interest.

What are the "exceptional situations" referred to in the declaration of the American Public Health Association which I just quoted? First, I would call attention to the matter of law enforcement. As stated by the declaration, the authority granted to health departments is very broad. While it may be said to the credit of health agencies that they have not abused this power, they may, on the other hand, justly be condemned for not having exercised it sufficiently when needed.

Today people are literally begging to be directed in constructive action which will promote success in the war. The various polls and barometers of public opinion consistently show that the people as a whole are far ahead of the framers of public policy in their willingness to surrender customary rights and privileges for the common cause. But, in order to make use of this popular disposition to sacrifice and help, some form of organizing and directing authority is needed. I am sure that if health departments merely undertook aggressive enforcement of existing laws and regulations, if they made use of the authority already vested in them, many of our most vexing problems would be resolved immediately.

This type of action does not require the time-consuming conferences and surveys which have constituted such a large part of the work of health agencies during the past 25 years. Needs have been established which we could not meet in peacetime, let alone now. A recent study of selective service physical examinations in Hagerstown, Md., showed that physical defects for which selectees were disqualified had been discovered in school surveys years before. Recommendations for correction of these defects had been made, but nothing had been done in most cases. Unless the means are at hand to correct the conditions uncovered by surveys, there is certainly no justification for

conducting them at this time. Health departments might better devote their attention to conditions which they are in a position to remedy.

This brings me to a fundamental fact which I have been emphasizing for years. That is, the health of the community rests on two basic factors: environmental sanitation and medical service.

We want sanitation, and we must have it. I have already mentioned how much could be accomplished in this respect by adequate law enforcement. But we cannot overlook the fact that, in order to put many premises into good sanitary condition, construction and installations are necessary. At the present time this brings us face to face with the many restrictions imposed on the procurement of materials, supplies, and labor. In making recommendations to property owners and occupants, these restrictions must be kept in mind. There is little point in telling a dairyman to install stainless steel pasteurizing equipment or in advising a restaurant owner to put in a mechanical dishwasher when these products have been taken off the market. We had sanitation before many of our modern improvements came into being. Until the new and improved products are available again, we will have to make the old ones do. I will even venture the possibility that before this war is over some of our sewage may again have to be carried in open ditches.

As the war progresses, the shortage of physicians, dentists, nurses, and the various technicians who play a part in medical service will become increasingly acute. Time will not permit me to dwell on methods of meeting shortages of personnel in all the professional branches, but what I say about physicians will apply to the others as well.

Many communities will be depleted of the physicians now practising there. In scarcely a town will there be found the empty waiting rooms which we

heard so much about a few years ago.

What are you going to do about it? Traditionally health departments have not concerned themselves with problems of medical care, except in so far as they are related to certain diseases and certain limited groups in the population. Today, however, the national interest requires broader participation in this form of activity.

In many places throughout the country large military camps have been established in sections where facilities for medical care are lacking or inadequate. The safety of both military and auxiliary civilian personnel requires that this need be met. The same is true in communities now devoted to the manufacture and assembly of essential war materials. The people working in these communities must be kept in good health and at a high level of efficiency. If a machine is idle because the worker who should tend it is sick, that machine is doing a job for Hitler. Yet, today there are such communities without physicians, and there are others where the ratio of physicians to population is as low as 1 to 3,000. Hours which could be devoted to work are spent in crowded waiting rooms of doctors who are perhaps too busy and exhausted to give satisfactory care. Worst of all, under such circumstances, days and weeks of valuable working time are lost when neglected minor ailments result in serious illness.

Then there is that vast reservoir of young man power now kept from active military duty because of remediable physical defects. Rehabilitation services which will make these men available are needed at once. It is recognized, of course, that doctors cannot be trained and provided in a few months' time. The obvious way of meeting the situation, therefore, is to streamline and utilize whatever resources we now have, to organize medical service around clinics where necessary, and to supple-

ment the higher skills with lesser ones. In short, in these critical localities, medical services must be developed on a wholesale rather than a retail basis. The official health agencies must initiate or at least take an active part in the reorganization of medical services wherever present deficiencies interfere with war work. The same applies to the provision of hospital facilities. In many instances health agencies may have to engage in direct operation of hospitals. They may also be called upon to operate new or expanded sanitation facilities.

The people of the nation quite naturally look to the health departments for technical assistance in the organization and operation of civilian defense programs. Here is a new field of endeavor involving many time consuming obligations. But it is also a field which presents unparalleled opportunities for enlisting public cooperation and support.

Unfortunately it is customary to think of additional personnel as a natural corollary to additional duties. Not only are larger staffs impossible at present, but health departments may expect to lose many of the professional workers they now employ. These workers—physicians, nurses, and engineers—all possess experience and skills urgently needed by our fighting forces. They cannot be retained in their present capacities simply because they are performing socially useful work. Unless they are actually doing work that is *more* important than what they could be doing with the armed services, the health department has no right to retain them.

How then are the increased duties to be performed? It is obvious that everybody will have to work harder. I doubt if anyone will object to that. But when I say that it will also be necessary to employ substandard or partially trained personnel, I am not so sure but that complaints may be forthcoming. Nevertheless, it is the only

way the task can be done, and it must be done. At the present time, maintenance of the highest possible type of health services is not the chief consideration. The important thing is to see that necessary services *are* performed with whatever types of workers and facilities are available. Present well qualified staffs of health agencies must concentrate on training and supervisory activities, and routine duties must be performed by those with less skill and experience. The extent to which this dilution process will have to be carried out cannot be foreseen. It depends on the duration of the war and the demands of the army, navy, and war industries.

I am not proposing that merit systems of personnel administration, laboriously evolved, be scrapped. That is not necessary. The situation can be met by the creation of interim classifications, permitting the employment of substandard personnel for the duration of the emergency.

The health agencies of the country may not be permitted much longer to decide whether certain tasks should be done or not. If the tasks in question are essential to victory they will be done—if not by the health departments, then by some other agency or agencies. That is the only way in which the future of our country can be assured. And I believe it is fair to say that the future pattern of public health organization of this country will depend upon how health departments meet the challenge of the present situation. Either they will emerge from the war as stronger, more useful, and more respected servants of the common weal, or they will have been eclipsed by others who forged ahead while they lagged along at the usual pace.

Undoubtedly many of you are a bit dismayed by the magnitude of the tasks thrust upon you by the war. I wish, however, to call your attention to an-

other aspect of the situation. I believe you should consider yourselves both privileged and honored by the vital rôle assigned to you in seeing the nation through the most critical period of its existence.

You will have to endure many

trials and disappointments. You may have to expend the last ounce of your energy in the service of your country. This, however, has always been the lot of men and women in key positions during the crucial periods of history.

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## Reports on Food Habits Available

THE attention of the Association has been called to the fact that the Committee on Food Habits of the Division of Anthropology and Psychology, National Research Council, 2101 Constitution Avenue, Washington, D. C., has available reports which will be of interest and concern to a variety of persons dealing with populations having national or racial food habits.

Among the reports available are the following:

"Italian Food Patterns and Their Relationship to Wartime Problems of Food and Nutrition."

"The Relative Effectiveness of a Lecture Method and a Method of Group Decision for Changing Food Habits."

"A Group Test for Determining the Anchorage Points of Food Habits."

Also conferences of the Committee on Food Habits relating to the contributions from the fields of child development and market research.

# Vaccine Prophylaxis against Tularemia in Man

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IT is characteristic of tularemia that most patients develop a high degree of natural resistance after infection occurs. The mortality is low. Recovery confers lifelong immunity which protects against subsequent massive exposures with an effectiveness seldom encountered in bacterial diseases. Second attacks of disease are unknown. Local reinfections occur occasionally among immunes subjected to repeated exposures to virulent strains but, as Francis first indicated, they are either asymptomatic or associated with brief and mild constitutional symptoms.<sup>1</sup> One of us has recorded apparent immunity, due to vaccination, which successfully withstood accidental massive exposures to strains of high virulence.<sup>2</sup>

Although tularemia is of minor importance as a cause of death it has considerable social and economic importance in areas of high endemicity as a cause of prolonged morbidity and disability. Its capacity to disrupt normal activities of military encampments is recognized.<sup>3</sup> The extreme ease with which infection is acquired, and the high infection rates among butchers and market men, scientific investigators, rabbit hunters and their wives and cooks who prepare game for the table, indicate the desirability of better methods of protection than those now in use.

Preliminary experiments with heat

killed and formalinized *Bacterium tularensis* \* suspensions demonstrated clearly that vaccines made by these methods, from either virulent or avirulent strains, provoked severe and extensive constitutional and local reactions upon initial injection into normal individuals. Reasonably well tolerated doses were so small that several months of daily injections were required to produce agglutinin titers to 1:320, a scheme tolerable for a few laboratory workers but impracticable for large scale use.

The successful efforts of Ramon and his associates to diminish primary toxicity of toxins and of various bacteria without significant impairment of their antigenicity, by various chemicals, led us to try similar methods. We established the following specifications for an acceptable vaccine:

1. It should be capable of subcutaneous administration, being well absorbed and not producing sterile abscesses.

2. Toxicity upon initial injection must be diminished to a degree to permit a three injection scheme of administration.

3. The three doses must contain enough bacteria of sufficient antigenicity to confer protection.

4. Such doses must provoke no constitutional reactions nor severe local reactions.

5. The mode of preparation must be readily and reliably reproducible.

\* Under the rules of uniform nomenclature adopted by the American Journal of Public Health, the name of *Bacterium tularensis* should ordinarily be classed as

After many trials on human volunteers with vaccines made by a variety of chemical procedures the vaccine which best satisfied our criteria was one made by oxidation of virulent strains by nitrous acid. This vaccine was adopted in 1932.

#### PREPARATION OF THE VACCINE

##### a. *Selection of cultures*

Only strains of high virulence were used. Virulence was maintained by frequent serial passage in guinea pigs, killing all animals within 96 hours after cutaneous inoculation. Virulence for rabbits was not determined regularly. Occasional trials showed that the strains used killed these animals within 5 days after cutaneous inoculation. Virulence was titrated regularly in white mice. Serial dilutions were made from a saline suspension having a turbidity equivalent to that of 500 p.p.m. of a fullers' earth standard (T-500). The acceptable range of virulence was that which killed all mice, in lots of 5, in dilutions of T-500  $\times 10^{-7}$  to  $10^{-9}$ , in 0.5 ml. intraperitoneal doses. The average mouse virulence was T-500  $\times 10^{-8}$ .

During the first few years vaccine was made from eight strains. Since no antigenic strain differences were recorded, or found here, we used for three years a vaccine made from a single strain. Thereafter, with possible unknown strain variability in mind, the vaccine was composed of equal parts of four strains.

##### b. *Preparation of suspensions*

The 48 to 72 hour growth on blood-glucose-cystine agar was harvested in salt solution and filtered through cotton to remove particles of media. By collecting growth from several bottles or many tubes into one volume of salt solution an initial turbidity varying from T-12,000 to T-25,000 was secured. Turbidity was accurately determined and recorded, and the volume of sus-

pension carefully marked. Tubes were then centrifuged until the supernatant was clear, after which it was discarded.

##### c. *Oxidation procedure*

For each 3 ml. of packed bacterial sediment 5 ml. of freshly prepared 30 per cent aqueous sodium nitrite was drawn into a finely tipped pipette. The bacteria were suspended uniformly in this solution by repeated expulsions through the pipette. Five ml. of 30 per cent acetic acid was then added. This solution was made on the assumption of glacial acetic as 100 per cent. For larger volumes of bacterial sediment the nitrite solution was added in proportion of 3:5. The volume of acetic acid solution was always equivalent to that of nitrite solution.

After addition of acid, evolution of gas was noted at once. The tubes or centrifuge bottles, carefully marked for original volumes, were stood at room temperature for 4 hours. During the course of the study it was found that oxidation for 4 hours produced maximal diminution in toxicity consistent with minimal loss in antigenicity. Removal of acids and salts was facilitated by adding sterile distilled water up to convenient capacity of the receptacles. For the first two washings this shortened the time for quantitative centrifugation of cells. Four washings were needed to remove all traces of acid. Sterile saline was used for the last two washings. Thereafter the bacteria were thoroughly resuspended in 0.5 per cent phenolized salt solution up to the marks of original volumes. Chemical treatment alters so greatly the refractive index of bacterial suspensions that turbidity measurements must be made prior to oxidation.

##### d. *Completion of the vaccine*

In accordance with initial turbidity readings each tube was then suitably



diluted with phenolized saline to produce a final theoretical turbidity of T-6,000 which is approximately equivalent to a density of 24 billion bacteria per ml. After the usual tests for sterility the vaccine was bottled and stored at 4° C. until needed.

Keeping quality at storage temperature is limited. When diluted 1:60 and used to provoke cutaneous reactions in infected or recovered individuals a sharp falling off in reactivity was noted after 13 to 15 months. We made a fresh supply each autumn and marked expiration date for 12 months.

#### METHODS OF STUDY OF THE VACCINATED GROUP

##### *Selection of individuals*

Vaccine was administered only to susceptible individuals exposed to risk of infection. Selection was entirely at random, and on a volunteer basis. Prior to 1937 a considerable proportion of the vaccinated group was composed of those occupationally exposed; butchers, market men, professional rabbit hunters, and seasonal game handlers. In 1937, a municipal ordinance prohibited the sale of wild rabbits. Since then there has been no occupationally acquired tularemia in Cincinnati; a record contrary to previous experience. Food handlers had no further need for vaccine. Coincidentally there was a great increase in requests for vaccination of amateur rabbit hunters, their wives and cooks. Thus the composition and probable exposure risk of the vaccinated group were significantly altered.

During the entire period of vaccine preparation all laboratory personnel handling virulent cultures and infected animals were vaccinated.

##### *Vaccination records*

Duplicate records were kept of all vaccinated individuals. The items recorded annually were: name, age,

address, occupation, history of previous tularemic infection, the usual annual game bag, last year's total of rabbits killed; the dates of inoculation, size and number of doses, turbidity of vaccine, local and general reactions; also the results of agglutination tests and cutaneous tests, and notation of acquisition of tularemia after vaccination, with laboratory data.

##### *Detection of recovered immunes among applicants*

For reasons which will appear later great care was exercised to avoid giving vaccine to all who had had tularemia. Careful inquiry usually sufficed to detect recovered individuals, even though some did not know they had had "rabbit fever." When there was a dubious history we resorted to agglutination tests or cutaneous tests, withholding vaccine until final judgment could be made. In our hands these tests proved to be reliable indices of past infection.

##### *Agglutination tests*

Information concerning antigenicity of the vaccine was obtained by serum agglutination tests. By random selection individuals were examined for agglutinins each year. Eventually these results were grouped according to: (1) tests performed after initial vaccination, (2) tests prior to revaccination, and (3) after revaccination.

##### *Detection of tularemia in the vaccinated group*

Searching inquiries were made each year to discover tularemic infections among the vaccinated group. Since the laboratories of the Department of Health and of the Department of Bacteriology maintained free diagnostic services the great majority of all cases of tularemia were reported directly to us. Due to their own interest in the experiment most vaccinated individuals

promptly reported the occurrence of infectious disease. We believe our case finding methods disclosed every case among the vaccinated group, as well as the overwhelming majority of all cases in the community.

#### *Study of the cases found*

Every vaccinated individual who contracted tularemia was carefully observed with special reference to severity of infection, occurrence of visceral lesions, and duration of the various measurable clinical aspects of the disease for which we had control morbidity data.

Cases which occurred among vaccinated laboratory personnel were also studied carefully, and will be considered separately.

#### *Administration of vaccine*

Although the adoption of a maximal turbidity, and of a standard oxidation period, had to wait until experience indicated what was optimal the mode of administration remained uniform. Three doses of 0.5 ml. each were injected subcutaneously and alternately into the arms, on either consecutive or alternate days. It was found advisable to complete administration within a 6 day period. A delayed third injection fre-

quently provoked constitutional reactions and unduly large local reactions. Otherwise constitutional reactions were extremely rare, and local reactions were moderate. The necessity for lay-off from customary work did not arise. During the past five years this standard dose contained a total of 36 billion bacterial cells. The ratio of the tolerance dose of this vaccine to that of formalized vaccine is 1,200:1.

#### *Revaccination dosage*

No constitutional reactions were observed upon revaccination prior to the introduction of the T-6,000, 4 hour oxidized vaccine. After its adoption, constitutional reactions were provoked by the initial dose of 0.5 ml. of the second annual series in about 60 per cent of individuals. This necessitated revision of the schedule for revaccination. Thereafter all applicants were given a trial first injection of 0.25 ml. The second and third doses varied in accordance with appearance and degree of reactions. If both general and local reactions were marked, no more vaccine was given that year. If there was no general reaction but marked local reaction, the subsequent doses were 0.25 ml. each. If neither general nor undue local reaction occurred the subsequent

TABLE 1

TABLE 1 shows for each year the turbidity of tularemic vaccine used, its duration of oxidation, number of persons vaccinated and revaccinated, and the maximal number exposed to risk of infection.

#### *Vaccination of Applicants*

Year	Vaccine		Applicants		Percentage Revaccination for Each Year	Cumulative Total of Individuals Vaccinated
	Turbidity	Hours Oxidized	Vaccinated	Revaccinated		
1931	1,000	16	72	0		72
1934	3,000	16	267	15	0	339
1935	3,000	13	48	3	5	387
1936	1,000	4	106	21	14	493
1937	6,000	4	123	53	17	616
1938	6,000	4	118	84	30	734
1939	6,000	4	732	176	42	1,466
1940	6,000	4	224	301	19	1,637
1941	6,000	4	456	339	58	2,145
			2,145	597	43	

doses were 0.5 ml. each. This plan gives maximal protection at minimal physiologic cost. Variations in density and oxidation periods of the vaccine are shown in Table 1.

#### *Vaccination of recovered immunes*

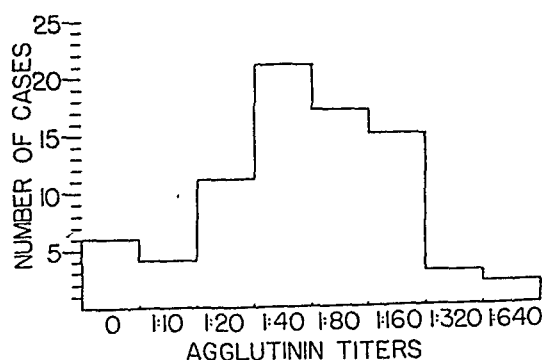
It is unnecessary and inadvisable to vaccinate persons who have recovered from tularemia. Since they are already protected for life the general and local reactions of unusual severity which inevitably follow serve no useful purpose. Since residual serum agglutinins are almost invariably present after recovery, and since cutaneous sensitivity is almost always present for many years thereafter, accurate methods for the detection of immunes are readily avail-

chills and sweats, agonizing headache, and intense pains in all muscles and joints. He exhibited alternation between hypomanic activity and confused, stuporous delirium. On the 3rd day the general reaction abated, and after the 4th day recovery was prompt and uneventful. At the height of reaction the entire upper arm was enormously swollen, presenting the picture of a severe Arthus reaction with central pallor and liquefaction necrosis. The regional axillary nodes were large, painful, and very tender. The local reaction persisted for 9 days.

#### *Agglutinin titers after vaccination*

Serum agglutination tests were performed by the standard macroscopic method. Figure 1 shows the titers observed in 79 individuals after initial vaccination. Blood samples were taken from the 6th to the 44th day after the third injection, the majority from the 10th to the 18th day, the largest number on the 14th day. Under these conditions agglutinins were present in 92 per cent of sera. Positive titers ranged from 1:10 to 1:640; the greatest number being 1:40. Highest titers were obtained during the 3rd week after vaccination.

FIGURE 1

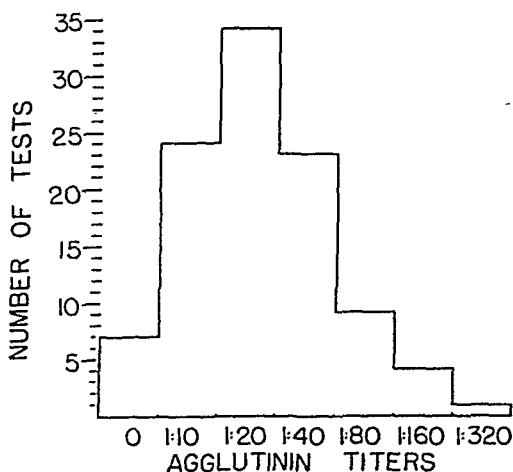


Agglutinin titers after initial vaccination: 79 individuals.

able. Where agglutination tests cannot be had, the vaccine should be diluted 1:60 with salt solution and injected intradermally in 0.05 ml. amount, and the site examined 48 hours later.

Although we exercised great care to avoid vaccinating immune persons we committed this error five times. The reaction of one man was typical of all. Eight hours after injection he had a severe chill, a splitting headache, and severe bodily pains. The temperature was 104.8° F. After an hour he vomited, and continued to vomit even water for the next 48 hours, during which fever continued with recurring

FIGURE 2



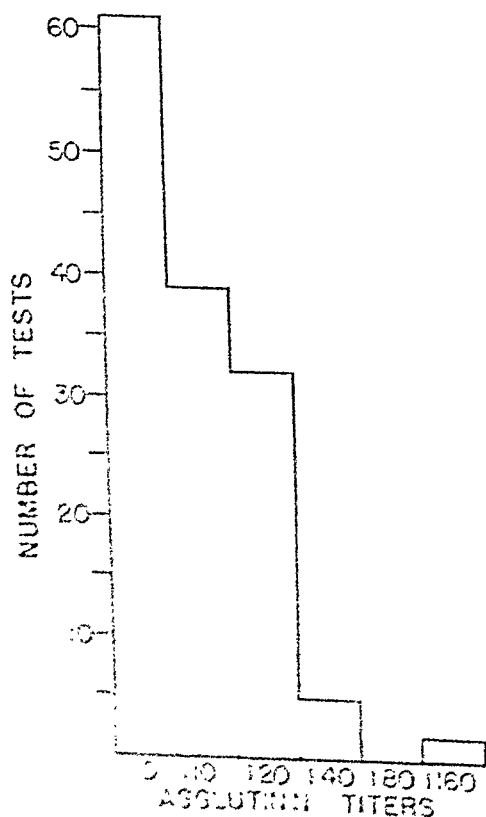
Agglutinin titers after revaccination. 102 tests.

Agglutinin responses after one or more revaccinations were measured in sera obtained from the 2nd to the 48th day. The largest number of samples was secured during the 3rd week after inoculation. Agglutinins were present in 93 per cent of sera. Positive titers ranged from 1:10 to 1:320; the greatest number being 1:20, as shown in Figure 2.

*Persistence of agglutinins provoked by vaccination*

Since naturally acquired immunity is accompanied by persistence of serum agglutinins we measured the residual titers one year after vaccination. Figure 3 shows the titers found in 138 tests of sera obtained just prior to revaccination. Agglutinins were present in 56 per cent of sera. Positive titers ranged from 1:10 to 1:160; the largest number being 1:10.

FIGURE 3



Agglutinin titers 1 year after vaccination. 138 tests.

*Evidence for immunity derived from constitutional reactions*

Constitutional reactions were provoked only by revaccination, not by initial vaccination unless the last dose was delayed beyond the recommended interval. Although the intensity was much lower, the character of these reactions was identical with those produced by vaccinating an immune person. This suggested that some degree of residual immunity persisted for at least one year in about 60 per cent of those vaccinated. The agreement observed between the incidence of constitutional reactions occurring after revaccination (60 per cent) and the proportion of residual serum agglutinins (56 per cent) supported this suggestion, since almost every person who suffered a reaction had yielded serum, secured just before revaccination, which showed residual agglutinins.

*Optimal time relation between vaccination and exposure*

Experience does not permit a definite statement concerning the optimal time for prophylaxis in relation to anticipated exposure. Maximal agglutinin titers occurred 3 weeks after vaccination but it does not follow that maximal protection was conferred then. The majority of our people were vaccinated from 3 to 4 weeks prior to exposure. A number considerably in excess of 200 received vaccine within 48 hours of first exposure. None acquired the disease. Eight physicians, not included in the group under discussion, were vaccinated during possible incubation periods. Each had been contaminated, on the hands or in the eyes, with infected human exudates. None acquired the disease. We cannot say that any person in either of the above groups would have acquired the disease had he not been vaccinated. The risk was high but not certain. It was demonstrated that vaccination just prior to or im-

mediately after exposure did not have any adverse effect. In one instance we unwittingly vaccinated a hunter during the incubation period of a naturally acquired infection. Since he was febrile for only 8 days, never went to bed, and never laid off work for even a day, the effect in this patient was significant amelioration and shortening of the disease. We recommend that prophylaxis be completed at least 3 weeks before the anticipated exposure, but that there need be no fear of inducing harmful effects by administering vaccine immediately prior to exposure or during the incubation period.

#### *Observations on the exposed vaccinated group*

In the manner outlined above susceptible exposed individuals were vaccinated each year from 1933 to 1941, inclusive. In all, 2,145 persons were vaccinated. This number is exclusive of all professional groups or individuals. Table 1 shows the numbers of persons vaccinated and revaccinated, and the maximal number exposed to infection, during each year.

It was not possible to establish a control group of equivalent size consisting of persons given injections of inactive solutions or of heterologous vaccines. Even had we been able to do so we could not have obtained any precise knowledge of the relative exposure rates.

#### *Exposure risk*

If the ordinance forbidding sale of wild rabbits in local markets had not been passed we could have established relative exposure rates and disease incidence rates for the vaccinated and unvaccinated occupationally exposed groups. The total numbers of game handlers, of recovered immunes, and of wild rabbits handled each year were known. However, sales were stopped before the number of individuals in-

involved and the duration of their experience were large enough to be significant. The impossibility of control of many important variables left us unable to estimate the exposure risk of hunters and housewives who formed the balance of the experimental group. Considerable information was acquired concerning the total number who hunted each year, the number of rabbits killed per year per hunter, the average infection rate among rabbits, and so forth; but in our opinion no manipulation of these figures would yield defensible data.

Fourteen vaccinated persons acquired tularemia. Table 2 shows the relation of these cases to the annual prevalence of disease, and its severity, among the general population in the area which supplied the vaccinated group. No inference concerning the relative incidence of disease can be drawn since the total number of exposed individuals in the general population is unknown. The figures are presented to show that tularemia occurred in this area during every year that the exposed vaccinated group was observed, and that the infecting strains were sufficiently virulent to give a case fatality rate of 7.6 per cent for the 9 year period. Absence of cases among vaccinated persons in 1939 is probably a reflection of the abnormally small number of rabbits found that year, a fact which also best explains the unusually low incidence of disease. In regions where almost all human cases derive from contact with wild rabbits it has long been known that annual prevalence of tularemia depends upon the size of the rabbit population and the infection rate among rabbits, the latter varying chiefly with the total rabbit tick population and the tick infection rate.

It may be significant that during the large regional outbreak of 1936, with 140 cases and 8 deaths, only 1 case occurred among those vaccinated. All

TABLE 2

In Table 2 for each year are shown the maximal number of vaccinated persons exposed to infection, incidence of tularemia and of deaths among those vaccinated; also, the tularemic morbidity and mortality in the unvaccinated population of the same region.

Year	Experimental Group			General Population (size unknown)	
	Number Exposed	Number Infected	Deaths	Cases	Deaths
1933	72	0	0	29	0
1934	339	1	0	45	2
1935	387	3	0	24	3
1936	493	1	0	140	8
1937	616	2	0	26	4
1938	734	1	0	30	4
1939	1,466	0	0	8	1
1940	1,687	2	0	14	0
1941	2,145	4	0	41	5
		14	0	357	27

Case fatality rate 7.6%

TABLE 3

Incidence of tularemic infection in relation to quantity and antigenicity of vaccine, and to time of administration of vaccine. Vaccines with turbidities less than T-6,000, and those oxidized for more than 4 hours, were poorer immunizing agents.

In eight patients infection occurred one or more years after the last vaccination.

Infections among the Vaccinated

Case	1933	1934	1935	1936	1937	1938	1939	1940	1941
1	v (2)	0	0 x	....	....	....	....	....	....
2	v	0	0	v x	....	....	....	....	....
3	....	v x	....	....	....	....	....	....	....
4	....	v	0 x	....	....	....	....	....	....
5	....	v	0 x	....	....	....	....	....	....
6	....	....	....	v	0 x	....	....	....	....
7	....	v	0	0	0 x	....	....	....	....
8	....	v	0	0	0	v x	....	....	....
9	....	....	....	....	....	i-p	....	....	....
10	....	....	....	....	....	v	0	0 x	....
11	....	....	....	....	....	....	....	v x	....
12	....	....	....	....	....	....	v	0	0 x
13	....	....	....	....	....	....	....	v	v x
14	....	....	....	....	....	....	....	v	v x
Vaccine									
T--	1,000	3,000	3,000	6,000	6,000	6,000	6,000	6,000	6,000
Hours									
oxidized	16	16	18	4	4	4	4	4	4

v vaccine administered  
 (2) only 2 doses received  
 x tularemia infection  
 i-p infection occurred during incubation period

of the 493 individuals hunted or handled wild rabbits which were very plentiful that year.

*Evidences of protection conferred by vaccination*

The incidence of tularemia in the vaccinated group, though less than that anticipated, does not give reliable evidence of protection. More convincing evidence of the value of vaccination was obtained by study of vaccinated individuals who acquired the disease. Table 3 shows the intervals which elapsed between vaccination and infection.

During the course of this study one of us collected quantitative data on the measurable aspects of morbidity from 518 patients who had no treatment other than the usual symptomatic or expectant measures. These were collected to provide a standard American morbidity experience against which the results of any form of therapy or prophylaxis might be compared quantitatively. An analysis of these data,

demonstrating their appropriateness for such use, has been published.<sup>4</sup> Table 4 shows comparable morbidity data from the 14 vaccinated, infected patients. The order of cases is the same as in Table 3.

Disability was measured by the number of days full-time work was not performed. Three patients worked uninterruptedly, and 4 others were disabled for 14 days or less. Nine were disabled for less than a month. The chief cause for prolongation of disability was suppurative lymphadenitis. In case 3 there was serial suppuration of twelve nodes. Pneumonia, with dry pleurisy, occurred once, in case 14. In over half of the cases fever was not only greatly shortened in duration but markedly ameliorated in degree, maximal temperatures being 102.5° F., or lower. In 10 patients there was striking amelioration of the customarily severe initial general symptoms, headache, arthralgias, myalgias, sweats, anorexia, and nausea. This was particularly impressive in those patients who

TABLE 4

Morbidity values were measured by the same method used for determination of morbidity constants in 518 control patients.<sup>4</sup> The low incidence of suppurative lymphadenitis in the next to last column has little significance in a series this small.

*Duration of Measurable Aspects of Disease in Vaccinated Infected Patients*

Case	Months' Duration			Days' Duration			Supp. or Not	Serum Therapy
	Disease	Adenopathy	Disability	Fever	Bed	Primary Lesion		
1	2.1	1.5	0.7	10	16	69	+	+
2	1.6	3.0	1.6	12	7	43	0	+
3	4.4	4.4	0.5	8	3	..	+	+
4	1.0	0.8	0.8	16	15	9	0	+
5	1.75	0.5	0.1	4	4	29	0	0
6	1.9	2.7	2.7	24	26	30	+	0
7	2.2	2.2	1.25	21	21	30	0	+
8	0.3	1.5	0	8	0	26	0	0
9	2.3	2.3	0.5	28	12	..	+	0
10	2.0	2.0	2.0	60	25	30	+	0
11	1.2	2.9	0	21	0	22	0	+
12	0.75	1.4	0	7	0	15	0	0
13	1.0	1.2	0.5	14	7	30	0	0
14	2.3	2.3	2.8	32	32	21	0	+
Average	1.8	2.1	1.0	17.5	12	29.5	37.7%	50%

did not receive serum therapy. It should be noted that in general the shortest and mildest infections occurred in those who had had the most vaccine, and for whom the intervals between vaccination and infection were not longer than 3 months.

Seven patients received serum therapy. Indications for use of serum were presence of pneumonia, initial symptoms of usual severity, unusually large number of large buboes in the first week (with the hope of lessening disability due to suppurations), or the desire to ameliorate symptoms and shorten the duration of illness. It is probable that serum treatment contributed to the favorable modification in the course of disease indicated by the figures in Table 4. Re-grouping of data to permit comparison between patients who received serum and those who did not is shown in Table 5. Those who re-

ceived no specific treatment exhibited significant amelioration and shortening of the disease.

A rough comparison of averages from the vaccinated infected cases with means from a large control group is shown in Table 6. Although durations of some aspects of morbidity were one-half to one-third of those for the control group, the small size of the vaccinated series does not justify overemphasis of the apparent value of vaccination, even though the probability of finding 14 consecutive cases of tularemia with such small morbidity constants by random selection is very remote.

Other evidence indicative of protection was obtained. Two identical experiences occurred several years apart, in which vaccinated susceptible butchers skinned and cleaned one rabbit for each of two customers. For each of the cus-

TABLE 5

Morbidity data regrouped with relation to specific serum treatment. The differences between the averages are probably not significant. The more severely infected patients received serum therapy.

*Comparative Morbidity Data from Patients with and without Serum Treatment*

Case	Vaccinated Infected Patients Treated with Serum						
	Months' Duration			Days' Duration			
	Disease	Adenopathy	Disability	Fever	Bed	Primary Lesion	Suppuration
1	2.1	1.5	0.7	10	16	69	+
2	1.6	3.0	1.6	12	7	43	0
3	4.4	4.4	0.5	8	3	..	+
4	1.0	0.8	0.8	16	15	9	0
7	2.2	2.2	1.25	21	21	30	0
11	1.2	2.9	0	21	0	22	0
14	2.3	2.3	2.8	32	32	21	0
Average	2.1	2.4	1.1	17	13	32	28%
Case	Vaccinated Infected Patients Not Treated with Serum						
	Disease	Adenopathy	Disability	Fever	Bed	Primary Lesion	Suppuration
	Disease	Adenopathy	Disability	Fever	Bed	Primary Lesion	Suppuration
5	1.75	0.5	0.1	4	4	29	0
6	1.9	2.7	2.7	24	26	30	+
8	0.3	1.5	0	3	0	26	0
9	2.3	2.3	0.5	28	12	..	+
10	2.0	2.0	2.0	60	25	30	+
12	0.75	1.4	0	7	0	15	0
13	1.0	1.2	0.5	14	7	30	0
Average	1.4	1.7	0.3	21	11	26	43%



TABLE 6

All means in the upper line are highly stable. For simplicity their probable errors were omitted. The vaccinated group showed favorable modifications in the important clinical and social aspects of morbidity.

*Rough Comparison of Quantitative Data*

	Months' Duration			Days' Duration			Suppurative Adenitis %
	Disease	Adenopathy	Disability	Fever	Bed	Primary Lesion	
A	3.8	3.4	3.4	32	31	39	56
B	1.4	1.7	0.8	21	11	26	43
C	2.1	2.4	1.1	17	13	32	28
D	1.8	2.1	1.0	18	12	30	36

A = Means from 518 untreated control cases

B = Averages from 7 vaccinated infected patients, without serum therapy

C = Averages from 7 vaccinated infected patients, with serum therapy

D = Averages from all 14 vaccinated infected cases

tomers the rabbit was the only exposure to infection. Both butchers remained well; each of the customers acquired tularemia. Similar experiences were reported many times by members of hunting groups. Those previously vaccinated remained well, even though they cleaned all rabbits shot by the party, whereas one or more of the unvaccinated members contracted tularemia several days later.

*Experience with vaccinated laboratory workers*

Work with virulent cultures of *B. tularensis* does not carry much risk of infection but it is well known that handling infected animals and carcasses entails great risk, amply confirmed by the large number of laboratory infections acquired by well trained, experienced investigators.

Since 1929 our laboratory has had 9 persons exposed to tularemia by the handling of infected animals or, very recently, of virulent cultures in liquid media. Four of us have been exposed for 12, 8, 7, and 3 years, respectively. Two others were exposed for 2 years each, and the last 3 for 1 year each. Our original plan was to administer vaccine to each exposed person annually in the fall. During recent years, when

the risk of contamination was known to be very high throughout the entire year, supplementary small injections of from 0.10 to 0.25 ml. of the vaccine were given every 3 or 4 months.

By oversight an animal caretaker who assisted in inoculating hundreds of animals annually was not vaccinated during the 2 years following his initial series. Vaccine was given in 1938, but inadvertently omitted in 1939 and 1940. He acquired the typhoidal clinical type in 1940, developing pneumonia and considerable pleural effusion. *B. tularensis* was recovered by blood culture on the 16th day of disease, the day serum treatment was instituted. He was ill for 1.8 months, disabled for 2.3 months, in bed for 29 days, of which 22 were febrile days. The serum agglutinin titer was complete in dilution of 1:10,240 on the 40th day after onset. Recovery was uneventful.

For the rest of us who received vaccine according to schedule the experience was far better. Two other men acquired the infection; the remaining 6 have escaped despite a considerable number of recognized contaminations with strains of maximal virulence, of which 3 could be properly described as massive.

The two additional laboratory infec-

tions displayed such marked evidences of protection that they deserve detailed description.

I. W. G. was vaccinated in 1939 before working with virulent cultures in aerated liquid media. During the next year he worked with other materials and was not vaccinated. He resumed work with *B. tularensis* in 1941, and was given six 0.25 ml. injections of vaccine. Three months later he crushed a glass bulb culture tube in his right hand, a piece of glass penetrating the palm to a depth of about  $\frac{1}{8}$  inch. The bulb was half filled with a 48 hour culture of a strain which killed all mice at  $10^{-8}$ , and 60 per cent of mice at  $10^{-9}$  dilutions, respectively. The wound was washed with soap and water. Immediately after the injury he received 0.10 ml. of vaccine into the right arm. On the following day he received 0.25 ml. into the left arm.

After an incubation period of 4 days he experienced a few chilly sensations, headache, aching of all joints of the right arm, and persistent interscapular backache. A very small reddened papule appeared at the site of injury; no lymphangitis or lymphadenitis. For the first 3 days he ached, felt "rocky," occasionally slightly chilly, and had low grade fever; no chills or sweats. He continued to work, complaining of occasional pain in the right axilla where no masses could be felt. Late in the 3rd day the nodule at the inoculation site measured 1 cm. in diameter, with a 3 mm. necrosing central area, the overlying skin yet unbroken. One node, 4 mm. in diameter, was felt in the right axilla. After painting with tincture of iodine the central necrotic area was carefully aspirated with a small needle. The material obtained was cultured, and a portion triturated in salt solution and injected into a guinea pig. After 3 days the cultures showed six colonies of *B. tularensis*; nothing else. The guinea pig died in 96 hours and showed

the typical gross lesions of rodent tularemia. Pure cultures of *B. tularensis* were obtained from its heart blood at autopsy.

The 5th day of disease was spent at home, due to fatigue and a mental "grogginess" which prevented clear thinking. He returned to work the next day, working almost two-thirds full time for 7 days. Thereafter he worked full time. Despite the needling the primary lesion did not ulcerate or further enlarge. Final healing, with slight scar, occurred on the 26th day. Four days after its appearance the enlarged axillary node measured  $2 \times 1.5 \times 1.0$  cm. Four days later it was less than 0.5 cm. in all diameters. It receded gradually without re-enlargement, and became impalpable on the 26th day. Low grade fever, averaging  $100^{\circ}$  F., persisted for 10 days. After that he was completely afebrile. On the 23rd day after initial symptom he developed a crop of typical erythema nodosum lesions, from just above the knees to the ankles, which persisted for 8 days. The maximal serum agglutinin titer was 1:1,280, on the 26th day after initial symptom. Beginning a month later he had two afebrile, symptomatic relapses, about 12 days apart. Each lasted for 1 day. The symptoms were fatigue, heavy sensation in the head, marked malaise, and slight arthralgias. Four additional recrudescences, each of only a few hours' duration, occurred about a week apart during the next month. For the past 6 months he has remained well.

In October, 1941, W. H. H. was inoculating large animals with saline suspensions of living strains of  $10^{-9}$  virulence for mice and guinea pigs. While injecting a goat with 3 ml. of a T-2,000 suspension of a 48 hour culture (about 8 billion bacteria per ml.) the needle was forced off the syringe tip, back-firing the entire contents into the face of the operator. Some liquid was felt to enter each eye; the re-

mainder streamed down over the mouth, neck, and chest. Within 15 minutes the face was washed with soap and water, a drop of 20 per cent argyrol was instilled into each eye, and 0.10 ml. of vaccine was injected into each arm. Three days later a third dose of 0.05 ml. of vaccine was given.

This man had been vaccinated once or twice annually for 7 years, the last injection 6 months prior to the accidental exposure.

Since past experience had shown that antiseptic or germicidal collyria possessed little value, ambulatory treatment consisted of thorough flushing of the conjunctival sacs with boric-saline solution five times during the first 2 days. No other treatment was administered.

On the second day after exposure both lower lids, and the right upper lid, were erythematous and edematous. In each conjunctival sac there were many minute oval, gelatinous, elevated areas of localized edema on erythematous bases. None showed erosion of the surface. There appeared one small red papule on the right cheek. There were no constitutional symptoms, fever, or regional lymph node enlargements. Smears of the conjunctival fluid showed a few small bacilli consistent in size and staining with *B. tularensis*. A guinea pig was injected with material swabbed from both lids of the right eye. This animal remained well.

On the 5th day a single yellow-gray nodule appeared in the mucosa of the right lower lid, surrounded by a red, velvety, inflammatory area. The focus of necrosis measured 3 mm. It was larger on the next day. Each morning the lids were stuck together with exudate. They were still thickened and discolored. The papular cheek lesion disappeared.

The solitary primary lesion enlarged during a period of 3 days, after which it receded rapidly, and disappeared on

the 9th day after exposure. At this time the entire area was normal in all respects. There was complete absence of fever, regional adenitis, and all constitutional symptoms. Work was continued energetically throughout the entire period.

Although the organism was not recovered by animal inoculation the serum agglutinin titer of the man rose from 1:80 4 months prior to the accident to 1:640 at 3 months after the local infection. Apparently vaccine had induced such a high degree of resistance that a massive contamination of both eyes resulted only in a solitary abortive primary lesion in one eye, possibly another on the cheek, without regional lymphatic extension and without the production of constitutional symptoms. The sequence of events, save for the site involved, was identical with some of the local reinfections seen in recovered immunes and described by Francis.<sup>1</sup>

All laboratory infections reported hitherto have presented the typhoidal clinical type of disease. The last two of the three cases reported here differ in that one was ulceroglandular and the other ocular.

The complete freedom from infection of three of us with a total of 23 exposure years, and the extraordinary degree of favorable modification of disease in the above two cases, are scarcely conceivable for tularemia as results due to any cause other than protection conferred by vaccination. This laboratory experience supports our opinion that a considerable part of the apparent freedom from infection and amelioration and shortening of the disease among members of the experimental group, were due to vaccination.

#### DISCUSSION

We would have preferred a standard type of vaccine, but under the stated circumstances and limiting conditions,

the oxidized vaccine was the only one found suitable for mass trials. The relatively low serum agglutinin titers indicate an antigenicity lower than that desired. We are unable to explain the observation that revaccination provoked titers which averaged lower and showed a lower extreme range than those induced by initial vaccination. Since revaccinated persons were better protected it is inferred that agglutinin titers bear little relation to the degree of protection. Decrease in antigenicity of vaccine due to oxidation was demonstrated by measuring agglutinin titers in rabbit sera after equivalent amounts of formalinized, heat killed, and oxidized suspensions were injected intravenously. Simultaneous injections and bleedings resulted in the titers shown in Table 7.

ous stages of recovery from disease invariably resulted in failure, when mice and highly virulent cultures were used, we did not try to measure protective antibody in sera from vaccinated persons. In controlled studies on the highly susceptible rabbit Downs demonstrated that formalinized vaccine induced a high degree of resistance and considerable protection against infective doses fatal to unvaccinated animals.<sup>5</sup> The survival periods of her control rabbits indicate challenge strains of less than maximal virulence. Unpublished experiments from several laboratories, including ours, are in agreement that vaccine prophylaxis of laboratory rodents consistently fails to protect against a challenge m.l.d. of any strain of maximal virulence. Under these

TABLE 7

Serum dilutions		1:10	20	40	80	160	320	640	1,280	2,560
Made by	Formalinized	4	4	4	4	4	4	4	4	3
	Heat killed	4	4	4	4	4	4	4	4	2
	Oxidized	4	4	4	4	4	4	2	0	0

Rabbit serum agglutinins produced by equivalent amounts of the three antigens. All titers were measured with standard formalinized antigen.

The agglutinability of oxidized bacteria was not altered, since sera from many animals always agglutinated such suspensions to titers found for formalinized suspensions. Furthermore, equivalent agglutinin absorption was demonstrated for oxidized and formalinized bacteria in equal amounts. Oxidation impairs antigenicity without altering the surface antigenic components which unite with antibody *in vitro*, indicating that surface components are not major factors in producing protection.

Living avirulent vaccines have not been tried.

Since many efforts by ourselves and by others to demonstrate protective antibody in sera from patients at vari-

conditions vaccinated animals occasionally die sooner than normal ones. We have not been able to protect rabbits with oxidized vaccine, regardless of the interval between vaccination and infection, if a strain of maximal virulence was used for the challenge dose.

With this infection it is likewise impossible to demonstrate passive protection by hyperimmune animal sera in laboratory rodents against infecting strains of maximal virulence. Our long unpublished experience is in complete agreement with that recorded by others.<sup>6</sup> The administration of serum from a long and heavily vaccinated uninfected person to a patient in the acute stage of tularemia resulted in a prompt and persisting lowering of temperature,

amelioration of symptoms, and reduction in size of buboes, but the serum had no protective value for guinea pigs. Rodents are unsuitable animals for either purpose. Many difficulties encountered in immunologic studies on experimental tularemia in rodents closely resemble those observed in experimental plague. In the absence of a suitable test host we are at present forced to rely upon results of studies on man for evidences of vaccine protection and of potency of therapeutic antisera.

Since the duration of protection probably seldom exceeds 1 year for the majority of those vaccinated, and is apparently less for the remainder, revaccination is advised at least annually when exposure is seasonal. If exposure is anticipated throughout a considerable part of the year, as in laboratory work, wild life investigations, or a military establishment in our western states where fly-borne or tick-borne disease commonly occurs throughout the summer, revaccination with small doses is advisable every 3 or 4 months during the period of exposure.

We appreciate that this study is incomplete, that the experimental group is small, and the observation period short. Our original plan to continue work until a large number of vaccinated individuals could be followed for many years, with extension and expansion of related laboratory studies, has had to be modified. Various factors associated with our entry into war have already operated to disperse the group, to alter exposure risks, and to modify otherwise conditions of study. The promising results obtained, and the possibility that vaccination might be advisable for men concentrated in certain regions during the war,

prompt us to report a summary at the present time.

#### SUMMARY

The experience with 2,145 exposed, susceptible persons indicated that a useful degree of protection was conferred by annual vaccination.

More frequent vaccination of exposed laboratory personnel gave more convincing evidence of a high degree of protection.

The vaccine had certain stated disadvantages partly outweighed by the following practical advantages: ease and safety of subcutaneous administration without provocation of severe reactions or of sterile abscesses, short administration period, and reliable reproducibility on small scale production.

Individuals who were not completely protected experienced significant favorable modifications in the course of disease.

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# The Relation of Childhood Infection to the Development of Tuberculosis in Early Adult Life

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IT is well known that the mortality from pulmonary tuberculosis is extremely low between the ages of 5 and 14 years. The great majority of tuberculous infections and lesions acquired during childhood retrogress without treatment, and reinfection-type pulmonary tuberculosis is rarely seen, even though a considerable portion of tuberculous children are presumably exposed to reinfection. The appearance of reinfection-type pulmonary infiltrations becomes more frequent in adolescence; it is probable that this change in the character of the tuberculous process is determined in large measure by age-linked factors.<sup>1</sup>

The belief that the seemingly benign infections of childhood are responsible for much of the morbidity and mortality from tuberculosis which occur in adult life is still widely held, as evidenced in recent publications.<sup>2-7</sup> Direct evidence for this belief is, however, meager. A number of studies have been reported in which the frequency of tuberculosis has been compared in persons who had had a positive tuberculin reaction and persons showing a negative reaction during childhood. Such studies show a higher incidence of tuberculosis in the group infected during childhood. The inference that the higher morbidity is the result of the childhood infection would

be valid, however, only in so far as the risk of infection in adult life is equal in the two groups. Thus, individuals remaining tuberculin-negative cannot be considered to have undergone a risk of developing tuberculosis. The assumption that subsequent exposure to sputum-positive tuberculosis is equally common among persons having household contact during childhood and those without childhood contact is demonstrably incorrect. In the present study, children having household contact with sputum-positive tuberculosis were five times more likely to have similar intimate contact during adult life than infected children not in household contact. In the case of tuberculin-negative children, there is a presumption that they reside in households free of tuberculosis and in areas where casual infection is uncommon, and where it is therefore relatively unlikely that they will have household contact in adult life. Whether the morbidity among persons who had been infected in childhood is the result of initial or subsequent exposure can be determined only if accurate information is available concerning the presence of household contact during adult life as well as in childhood. Such information has been obtained in families under supervision of the Henry Phipps Institute. The present report is a considera-

tion of the influence of household contact during adult life upon persons who had been infected during childhood; such an analysis should demonstrate the relative importance in the pathogenesis of adult tuberculosis of the initial infection occurring in childhood and subsequent exogenous infection resulting from household exposure during adult life.

#### MATERIAL AND METHOD OF STUDY

The records have been studied of families whose supervision at the Henry Phipps Institute began between 1924 and 1932. A detailed description of the medical and nursing supervision given these families has been made by Opie and McPhedran.<sup>8</sup> It is worthy of emphasis that home visiting by staff nurses has been equally intensive and persistent in families with sputum-positive tuberculosis, families with sputum-negative tuberculosis, and a control group of families free of tuberculosis. In no instance has family care been voluntarily discontinued; observation has been maintained except when families moved, leaving no trace. A recent interview with members of these families was obtained in a remarkably high proportion of cases. Recent roentgenological examination was obtained in a large percentage of the individuals observed but, in order to obtain results comparable to other studies of this type, the present report deals with the incidence of clinically manifest tuberculosis rather than with the incidence of roentgenologically demonstrable lesions.

The limit between childhood and adolescence has been arbitrarily placed between the ages of 13 and 14 years; it has been required for inclusion in the present series that the person before the age of 14 years have acquired naturally a positive reaction to 0.01 or 1.0 mg. of Old Tuberculin and have had a chest roentgenogram which was either negative or revealed primary-type lesions

only. Among the children fulfilling these requirements there were 982 concerning whose health status in adolescence and adult life information was available. The duration of observation after the age of 13 years extended from 1 to 17 years. The total number of person-years of observation during adolescence and adult life was 7,530. The mean duration of observation after childhood was 7.9 years for white males, 8.0 years for white females, 6.2 years for colored males, and 6.8 years for colored females.

Three white and 3 colored patients who had developed clinically manifest reinfection-type tuberculosis before the age of 14 years have been excluded, since the purpose of the present study is to determine the fate of infected persons who are apparently healthy upon entering adolescence. For the same reason, it has appeared desirable to exclude also persons who had asymptomatic reinfection-type infiltrations prior to the age of 14 years. This exclusion is practicable, since in the case of the 36 persons included in the study who developed manifest tuberculosis in adult life, it was demonstrable in all but 2 instances that reinfection-type disease was not present at the age of 13. The likelihood that these 2 persons had asymptomatic infiltrations during childhood is small. It should be emphasized that, although asymptomatic reinfection-type infiltrations appearing in childhood account for only a relatively insignificant portion of adult morbidity from tuberculosis, such lesions have serious clinical consequences as brought out by Sweany.<sup>9</sup> Six white girls, 1 white boy, and 3 colored girls were observed to have asymptomatic reinfection-type lesions between the ages of 11 and 13 years, and 8 of these individuals developed clinically manifest tuberculosis in adolescence. Inclusion in this study of persons having reinfection-type disease during childhood would result in a

somewhat higher morbidity rate for the group as a whole. The other findings reported are not substantially altered, however, as shown by a test analysis including these cases.

In recording the presence within the household of persons with positive sputum or of fatal cases of tuberculosis with history of cough and expectoration, the records have been compiled on an individual basis; that is, one member of a family born in 1920 and exposed to a sputum-positive grandfather dying in 1923 is recorded as having been in contact, while another member of the family born in 1925 is included in the group not exposed to positive sputum. The group of families in which sputum-positive contact was not present include families whose tuberculous members had sputum-negative (in large part asymptomatic) pulmonary disease or extrapulmonary tuberculosis, as well as families in which no member had tuberculosis. These groups have been combined for the purposes of the present study, since only slight differences in incidence of tuberculosis during adolescence and adult life were noted among members of these various groups.

Because of the importance of the age factor, the morbidity during adolescence and adult life has been calculated on an age-specific basis. The number of individuals under observation at each age was obtained by counting each person as many years as he was years under observation after the age of 13. Thus a person followed from the age of 6 to 18 is included in the totals for ages 14, 15, 16, 17, and 18.

The social and economic changes occurring in these families during the long period of observation are of interest. Dramatic changes in financial status were infrequent. Despite the economic depression of the last decade, there appeared to be improvement in the circumstances of a considerable portion of the families. In another large group of

families, however, in part presumably as the result of chronic illness in the household, the social and economic status deteriorated.

#### MORBIDITY AND MORTALITY DURING ADOLESCENCE AND EARLY ADULT LIFE— INFLUENCE OF AGE, COLOR AND SEX

Among the 982 persons observed, clinically manifest tuberculosis developed in 36 (Figure 1). These included among white males, 5 cases of pulmonary tuberculosis and 1 case of tuberculous cervical adenitis; among white females, 13 cases of pulmonary tuberculosis and 1 case of pleurisy with effusion; among colored males, 2 cases of pulmonary tuberculosis and 1 case of tuberculous osteitis; among colored females, 8 cases of pulmonary tuberculosis, 2 cases of pleurisy with effusion, 1 case of tuberculous osteitis, and 1 case of tuberculous meningitis. The disease was fatal in 14 instances.

Although the morbidity rate at various ages fluctuated considerably, Table 1 shows that the mean annual attack rate for the ages 14 to 21 years closely approximated the rate for the ages of 22 to 30 years, both in the white and colored groups. It is therefore permissible in subsequent calculations to consider that the risk of developing tuberculosis is the same in a year of observation at the age of 24 as in a year of observation at the age of 14. The cause of the static morbidity rate noted in this study will be discussed later under "Comment."

The annual morbidity rate was three to four times greater among Negroes (1.21 per cent) than among whites (0.33 per cent).

The morbidity among females at the ages studied was considerably higher than among males. The rate in white females (0.44 per cent) was twice that of white males (0.21 per cent), and the rate in colored females (1.69 per cent) was three times that of colored males





familiar observations on the general population, appeared to be independent of the time of occurrence of household contact with sputum-positive tuberculosis, and may properly be considered to be governed by constitutional factors.

Although the number of deaths was small, the rates paralleled those of

### *Age-Specific Morbidity after the Age of 13 Years among Individuals Who Had Been Tuberculin-positive in Childhood*

Age in Years	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
<i>White</i>																	
Number at risk	773	727	682	661	581	520	467	405	342	274	222	166	114	76	46	26	11
Number developing tuberculosis	1	3	2	2	2	2	2	2	2	0	0	1	0	1	0	0	0
Attack rate (per cent)	0.33								0.31								
<i>Negro</i>																	
Number at risk	209	191	180	155	132	112	94	69	53	41	29	20	19	11	8	5	0
Number developing tuberculosis	1	2	4	1	2	1	3	0	0	1	0	0	0	1	0	0	0
Attack rate (per cent)	1.2								1.1								

TABLE 2

*Tuberculosis Death Rate in Early Adult Life among Persons Who Had Been Tuberculin-positive During Childhood*

	<i>Number of Persons</i>	<i>Number Developing Tuberculosis</i>	<i>Number of Deaths from Tuberculosis</i>	<i>Total Person-Years of Observation*</i>	<i>Death Rate per 100,000</i>	
					<i>Observed</i>	<i>Expected†</i>
<i>White</i>						
Male	365	6	2	2,889	70	32
Female	408	14	3	3,279	92	47
<i>Negro</i>						
Male	90	3	2	559	360	220
Female	119	13	7	803	870	319

\* Includes, in contrast to the figures in Tables 1, 3, and 4, person-years of observation after clinical tuberculosis became manifest

† Calculated from the Philadelphia mortality experience for the years 1932, 1933, and 1934, adjusted to correspond to the age distribution of the population observed in the study

similar groups in the general population; i.e., the mortality was many times higher in Negroes than in whites, and was higher in young adult females than in young males. In each group the rate was roughly twice the rate expected in persons of corresponding age in the general population of Philadelphia (Table 2).

#### INFLUENCE OF HOUSEHOLD CONTACT WITH SPUTUM-POSITIVE TUBERCULOSIS

It is evident from the data presented in Table 3 and Figure 2 that a markedly higher morbidity occurred among persons intimately exposed to sputum-positive tuberculosis during adolescence than in those with no record of household exposure. The rate was equally

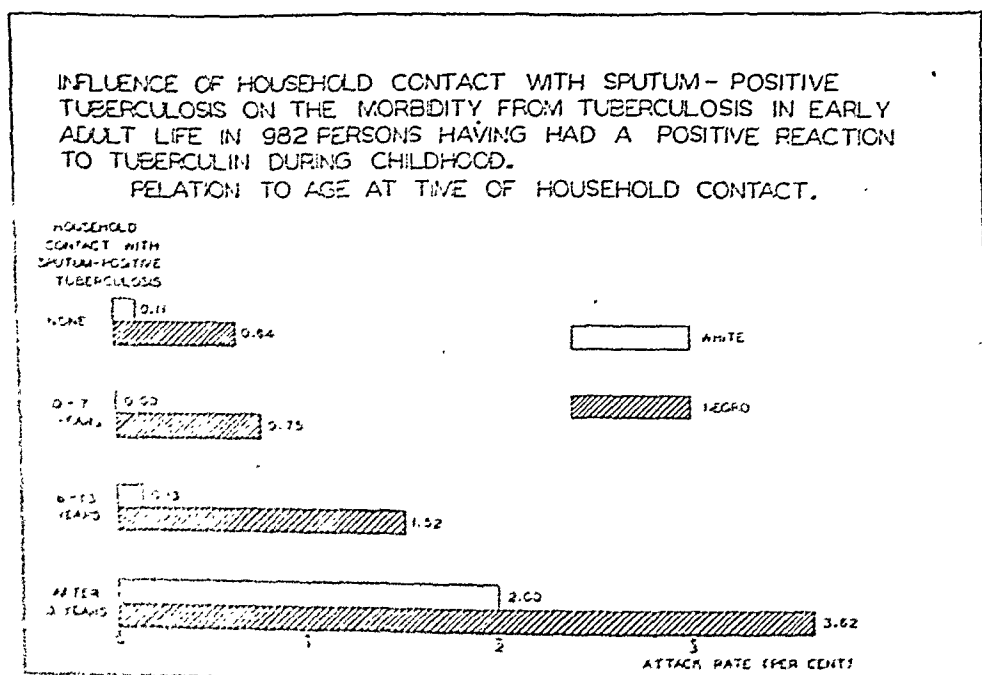


FIGURE 2

TABLE 3

*Influence of Household Contact with Sputum-positive Tuberculosis upon the Incidence of Clinically Manifest Tuberculosis among Young Adults Who Had Been Tuberculin-positive During Childhood*

	<i>Relation to Age at Time of Household Contact</i>					<i>Total</i>
	<i>None</i>	<i>0-7 Years of Age Only</i>	<i>8-13 Years of Age but Not Thereafter*</i>	<i>Before and After Age of 13 Years</i>	<i>14-30 Years of Age Only</i>	
<i>White</i>						
Number of persons	354	174	184	83	10	773†
Person-years at risk	2,743	1,045	1,524	705	47	6,064
Number developing tuberculosis	3	0	2	14	1	20
Attack rate (per cent)	0.11	..	0.13	2.00		0.33
<i>Negro</i>						
Number of persons	90	35	81	19	7	209†
Person-years at risk	622	134	460	87	23	1,328
Number developing tuberculosis	4	1	7	2	2	16
Attack rate (per cent)	0.54	0.75	1.52	3.62		1.21

\* Including children who had had prior contact

† Omitting reduplications resulting from inclusion of persons exposed in adult life in the groups without adult contact, prior to the onset of adult exposure

low among white persons not having household contact during adolescence, whether or not they had been exposed during childhood. A higher rate was observed among colored persons who had childhood contact than in those without a record of household contact; this was particularly notable in the case of persons last having contact in the later years of childhood, and is presumably correlated with the marked susceptibility of colored females in the early years of adolescence.

The differences in morbidity between persons having household contact during adult life and persons not having such contact are, on application of the chi-square test, significant in the case of the colored group and highly significant in the case of the white group.

Worthy of note also is the correlation between household contact during childhood, the prevalence of primary-type tuberculosis, and the occurrence of household contact in adult life. Household contact during childhood was noted in 418 white children; of these 83 (19.8

per cent) had continuance or recurrence of household contact in later life. Among 355 white children who did not have childhood contact, there were 10 (2.8 per cent) who had household contact in adolescence or adult life. Similarly, of 118 colored children having household contact, 19 (16.1 per cent) had similar contact in adult life; and among 91 colored persons not having contact during childhood, 7 (7.7 per cent) had household contact with sputum-positive tuberculosis in later life. It is evident that tuberculosis is more truly a "household disease" among whites than among Negroes.

Among the 418 white persons having household contact with sputum-positive tuberculosis during childhood, 165 (39.5 per cent) had roentgenological evidence of active or calcified primary-type pulmonary lesions, while such lesions were found in only 59 (16.6 per cent) of the 355 persons who did not have contact in childhood. The corresponding percentages among colored persons were 39.8 and 18.7.

RELATION TO ROENTGENOLOGICALLY  
DEMONSTRABLE PRIMARY-TYPE  
TUBERCULOSIS

Pope, Zacks and Sartwell<sup>10</sup> found a significantly higher morbidity in persons with roentgenological evidence of calcified childhood-type tuberculosis. In the present study, a higher morbidity rate was observed in white persons with calcified lesions (0.48 per cent) than in those with negative films (0.26 per cent), but the morbidity rate was 0.96 per cent among colored persons with primary-type lesions and 1.32 per cent in those with negative films. That this difference between whites and Negroes is not fortuitous, but may be due to a group difference in epidemiological behavior, is suggested by the observation that calcified primary-type lesions are much more often seen in association with clinical tuberculosis among white adults than among colored adults.<sup>11</sup>

The greater morbidity observed in white persons with calcified lesions may be due to the facts that calcified lesions occur more frequently in children having household exposure to sputum-positive tuberculosis and that persons having had household contact during childhood are more likely to do so subsequently. Calculation of mor-

bidity rates among both white and colored persons not having known household contact after the age of 13 years shows a slightly higher incidence among those having calcified lesions (Table 4). This difference may be the result of chance, as is suggested by the fact that the difference is not significant on statistical analysis, or it may actually represent a slightly greater risk resulting from endogenous breakdown.

EFFECT OF PREVENTORIUM CARE

Friedman and Billings<sup>12</sup> have reported a study of the incidence of clinically manifest reinfection-type tuberculosis among a group of persons followed after discharge from the Pendergast Preventorium. The 409 children studied had a mean age of 8 years on admission to the preventorium and a mean age of 21 years at the end of the follow-up period: the total number of person-years of observation may be calculated to be 5,318. In order to compare properly these data with those in the study of families at the Henry Phipps Institute, it is necessary to restrict the observation period to the interval after the age of 13 years. It may be calculated that 3,262 person-years of observation occurred after this

TABLE 4

*Morbidity from Tuberculosis among Young Adults Who Had Been Tuberculin-positive During Childhood. Relation to Presence of Roentgenologically Demonstrable Primary-type Tuberculosis in Childhood (excluding person-years of observation after onset of household contact in adult life)*

	Number of Persons	Person-years of Observation after Age of 13 (Prior to Adult Contact)	Number Developing Tuberculosis after Age of 13 Years	Attack Rate (per cent)
<i>White</i>				
Negative film	507	3,692	3	0.08*
Active or healed primary- type lesion	205	1,620	2	0.12*
<i>Negro</i>				
Negative film	144	856	8	0.92*
Active or healed primary- type lesion	62	369	4	1.11*

\* Comparison of the number of cases observed in persons with negative films and the number expected on the basis of the morbidity rate in persons with primary-type lesions reveals that these differences are not statistically significant.

age. All 9 of the cases which developed appeared after the age of 13 years,<sup>13</sup> giving a mean annual morbidity rate in adolescence of 0.28 per cent.

The number of children in the present study who received preventorium care was small. Twenty white children, or 2.6 per cent of the total, were in preventoria for intervals of more than 3 months. It is interesting, therefore, that the incidence of reinfection-type tuberculosis during adolescence in the entire group of white persons (0.33 per cent) is not appreciably greater than in the group of similar composition who had received care at the Prendergast Preventorium.

#### COMMENT

An annual morbidity from tuberculosis during adolescence and early adult life of 0.33 per cent and a mortality rate approximately twice that of the general population of Philadelphia may appear to be surprisingly low when it is considered that the population studied had been infected during childhood, was an indigent or semi-indigent one, living in a congested urban area, observed in large part during a period of severe economic depression, and further handicapped in a majority of instances by the presence of wage earners or other adults ill with the chronic disease of tuberculosis. Possibly the cause of this low rate lies in the relatively small number of persons who had recurrence of household contact with sputum-positive tuberculosis after childhood. It is an interesting question to what extent these findings represent the natural history of the disease under present-day conditions, or to what extent they have been influenced by the therapeutic and educational efforts made by the clinic physicians and public health nurses. Thus the fact that the same morbidity was observed in persons having preventorium care and in those not having such treatment, may be construed as indicating

that preventorium care has no effect on the morbidity in adult life or, on the other hand, may be interpreted as indicating that the educational efforts of a clinic of the type of the Henry Phipps Institute are as effective as preventorium treatment in reducing the morbidity from tuberculosis in later life. It should be recognized as a limitation of this type of epidemiological study that the mere fact that a family is urged to have examinations may alter its subsequent behavior and may lessen the spread of disease.

The mean annual morbidity observed in this study is, as has been pointed out, practically identical with the rate (0.28 per cent) which prevailed during adolescence in tuberculin-positive persons discharged from the Prendergast Preventorium.<sup>12</sup> A similar annual morbidity rate, ranging from 0.2 per cent at the age of 14 years to 0.4 per cent at the age of 18 years, was observed in the large series of observations on tuberculin-positive Massachusetts school children reported by Pope, Sartwell and Zacks.<sup>10</sup> It should be pointed out that the rates found in these three investigations are not comparable to the rate reported by Ch'iu, Myers, and Stewart,<sup>3</sup> for in the latter study a significant proportion of the morbidity and mortality observed occurred during childhood. Disease and deaths occurring before the age of 14 years have been excluded from the present study, which is concerned rather with the likelihood of subsequent development of tuberculosis in individuals who, previously infected, enter adolescence in apparent good health.

In neither of the Massachusetts studies was consideration given to the influence of household contact during adolescence. In the families studied at the Henry Phipps Institute it has been possible to obtain accurate information concerning the presence or absence of sputum-positive tuberculosis. Analysis

on the basis of this information indicates that the annual morbidity rate of approximately 0.3 per cent found in these studies represents a composite of a low rate occurring among those not exposed during adolescence and a high rate occurring among those having onset, continuance, or recurrence of household contact during adolescence. The extremely low rate observed in white persons not exposed to household contact in adult life is especially remarkable in view of the high risk of casual infection in the district of Philadelphia served by the Henry Phipps Institute. It seems reasonable to believe that the previous tuberculous infection afforded an increased resistance sufficient to protect against casual infection, although it is evident that this protective effect was obliterated when household contact with sputum-positive tuberculosis was present.

It is noteworthy that no rise in morbidity with increasing age was noted in the present study, in contradistinction to the generally recognized fact that the incidence of tuberculosis rises throughout adolescence and early adult life. This rise is considerably more rapid than the increment of infection during this period of life and must be considered the result in large part of age-linked alterations in resistance. The diminution in resistance during early adult life is masked in the present study by the fact that only persons infected during childhood have been included. In the general population, on the other hand, there is a constant accession of persons infected for the first time at the ages of 14, 15, 16, etc., and it is reasonable to assume that these newly infected persons account for a portion of the morbidity from tuberculosis in the latter years of adolescence and in adult life. In the general population, moreover, while the percentage of children having household contact is far smaller than in the group under study,

there is no such marked decline in occurrence of household contact during adult life as has been observed in the present study. Thus, in the general population, the likelihood of household exposure at the age of 20 years is less than at the age of 12 years only to the degree that the prevalence of open tuberculosis in the community has declined in the 8 year interval. The present study is comprised largely of members of tuberculous families: 54.6 per cent had contact with sputum-positive tuberculosis in childhood while only 12.1 per cent had contact in adolescence, reflecting the frequent termination of exposure either by death or as the result of treatment. It should be emphasized that although household contact in adult life was much more frequent among the members of families under study than it is in the general population, nevertheless it is true that the risk of household exposure for the group under study declined sharply in early adult life, while in the general population the risk declines only slightly. As a result of the sharp decline in occurrence of household contact in the group under study the excess of morbidity over the general population was great in early adolescence, and smaller in subsequent years, the net result being a static rate. In the general population, on the other hand, the almost constant risk of infection during adolescence to persons previously tuberculin-positive as well as tuberculin-negative, associated with a decline in resistance during these years, results in an ascending incidence of tuberculosis.

Pulmonary tuberculosis developing during adolescence and early adult life in persons who had not had household contact after childhood, may be endogenous, i.e., due to progression of the original infection, or exogenous, i.e., the result of fresh infection acquired outside the household. That both possibilities may occur<sup>2</sup> cannot be doubted,

but it is a question which is the more frequent. A striking example of the fact that not all tuberculosis developing in the absence of known household contact can be considered endogenous is afforded by the case of J. G., an Italian male. He was first examined in 1928 at the age of 13 years because of the diagnosis of asymptomatic minimal tuberculosis in his father. The tuberculin reaction was 2+ to 0.1 mg. OT, and x-ray examination of the chest was negative. In 1929 the tuberculin reaction was 1+ to 0.1 mg. OT, in 1932 the reaction was 3+ to 1.0 mg., and in 1933 there was no reaction to 1.0 mg. In January, 1935, there was no reaction to 0.005 mg. Purified Protein Derivative and x-ray examination of the chest remained negative. In March, 1936, at the age of 21 years, respiratory symptoms developed. The tuberculin reaction was 2+ to 0.00002 mg. PPD and x-ray examination showed moderately advanced tuberculosis. The sputum was positive.

Despite treatment, the patient died 18 months later. No other member of the household had sputum-positive tuberculosis, although a number of siblings developed or re-developed tuberculin sensitivity in 1937 and one became ill with pleurisy with effusion.

That similar reversion of the tuberculin reaction from positive to negative is not uncommonly observed when the tuberculin test is frequently repeated, has been shown by Dahlstrom.<sup>14</sup>

It has been pointed out<sup>15</sup> that in many of the studies demonstrating a higher incidence of tuberculosis in members of families containing a sputum-positive patient, the multiple family incidence might be due not to greater opportunity for infection but to a hereditary deficiency of resistance. The demonstration in the present study that the more recent the contact the greater the morbidity, suggests that multiple family incidence is due more

to the factor of infection than to genotypic factors.

The data reported in the present study give no information as to the relative risk of morbidity in adult life of persons infected in childhood and those uninfected. That a somewhat greater morbidity under equal conditions of exposure occurs among adults who are previously uninfected is demonstrated by most studies of student nurses and medical students,<sup>16</sup> and patients in mental hospitals.<sup>17, 18</sup> It is clear, on the other hand, that under the ordinary circumstances of life, infected and non-infected children do not undergo the same risk of exposure in adult life. No simple statement, therefore, can describe the risk of tuberculosis experienced by persons infected in childhood. A comprehensive statement must include the following considerations:

1. Morbidity and mortality from tuberculosis before adolescence, high in infancy, and very low during the remaining years of childhood, are by no means negligible, and of course occur only among those infected during childhood.

2. The survivors, i.e., those who enter adolescence with calcified lesions or without roentgenologically demonstrable lesions, exhibit under similar conditions of exposure a somewhat greater resistance than those previously uninfected.

3. On the other hand, persons having household exposure or having otherwise been infected during childhood undergo a certain risk of endogenous breakdown, and are under ordinary circumstances more likely to have exposure to infection during adolescence and adult life.

4. The greatest risk of tuberculosis in adolescence and adult life is experienced by those having recent household contact with sputum-positive tuberculosis, whether or not they were infected during childhood.

The person infected during childhood thus is at greater risk even though partially protected. He is better able to withstand casual infections; yet the very fact of having been infected in childhood carries with it a greater likelihood of encountering in adult life

household contact with sputum-positive tuberculosis. And against this intimate exposure, the increased resistance conferred by previous infection does not afford protection.

#### SUMMARY

1. Observation during adolescence and early adult life was given 982 individuals who had had a positive tuberculin reaction during childhood. Accurate information concerning the occurrence of household contact with sputum-positive tuberculosis was available.

2. The mean annual morbidity rate was 0.33 per cent in the white group, and 1.21 per cent in the colored group.

3. The mean annual morbidity rate was 0.21 per cent in white males as compared to 0.44 per cent in white females, and 0.54 per cent in colored males as compared to 1.69 per cent in colored females.

4. The mean annual morbidity rate was 0.1 per cent in white persons not having household contact after childhood as compared to 2.0 per cent in white persons having household exposure during adolescence and adult life; the corresponding rates for the colored group were 0.98 per cent and 3.62 per cent.

5. The morbidity rate in persons who had roentgenological evidence of primary-type tuberculosis was not, in the absence of household contact in adult life, significantly higher than the rate in persons with negative films.

6. The rate of 0.33 per cent observed in white persons, relatively few of whom had had preventorium care, was not appreciably higher than the rate calculated from comparable data reported in persons discharged from preventoria.

#### CONCLUSIONS

1. Morbidity from tuberculosis in adolescence and early adult life is more frequently the result of household exposure after childhood than before, indicating that in early adult life exogenous infection is of greater importance than endogenous breakdown of lesions acquired in childhood.

2. Case finding efforts in adolescence and early adult life should be directed toward persons having recent household contact with sputum-positive tuberculosis. Prolonged supervision of persons exposed during childhood is not indicated unless household exposure is continued or recurs in adult life.

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# Public Health and Medical Relationships in Industrial Health\*

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THE immediate necessity of this war is production of great amounts of military supplies. In fact, the length and outcome of this conflict are dependent on the rapidity with which our united armies can be equipped with tanks, airplanes, guns, munitions, and other accouterment, and transported to every continent of the world. We have seen the effectiveness of coördinated utilization of all types of mechanization in warfare. Just as they have been coördinated, so must the forces of production be coördinated. In a general sense production rests on only two factors—man power and materials. Even the flow of materials is dependent on man power. There the simplicity of the matter stops, consideration of man power is complex.

Its capacity to produce is affected by a multiplicity of influences—not the least of which is its physical well-being or health—as individuals and as a group. The importance of the health of the worker is not generally comprehended, despite the seemingly great amount of emphasis which has been placed on it.

All those working or actively interested in health have the grave responsibility of bringing about such changes as will result in maximum utilization of man power.

The early development of medicine

or health work was directed toward curing the sick individual. With the discovery of the specific cause of some diseases, immunization or prevention became effective. When employers were made financially responsible for injuries to workmen, prevention of accidents and occupational diseases became the wisest course. The results were material and easily visualized. But preventive industrial procedures in their broad application apparently do not lie within the conception of many industrialists and health workers. It is preventive industrial health that is so vital today. The term industrial health means all phases of industrial medical services — environmental sanitation, treatment of injuries, and, most important of all, prevention. Treatment of the sick or injured individual is of receding importance in this enlarging field. The incapacitated worker is to be restored as soon as possible, but more significant is keeping the well worker on the job and instituting measures which will improve those below par in order that they will not lose time.

War is impersonal, subjugating humanitarian interests to a secondary rôle. Though it is not entirely desirable to consider industrial health in the same manner, it can be done. Without doubt, it is the type of treatment of the subject most readily grasped. It has been stated that in 1941 there were 400 million man days lost in industry from physical disability—that this lost man power was sufficient to build 20,000

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bombers or a line of tanks 250 miles long.

Considering it from the dollars and cents angle—the loss to the wage earners alone at an arbitrary average wage of \$5 per day was 2 billion dollars.

The loss to the employer is greater. One authority<sup>1</sup> has stated that the direct loss from non-occupational illness due to disturbances of production is one and one-half times the wage of the absent employee. This means the direct loss to industry was 3 billion dollars. Figures issued by one manufacturer<sup>2</sup> reveal that a 50 per cent reduction of absenteeism would save them \$70 per worker. Thus a proper preventive medical program would save about 3½ billion dollars in the country as a whole. Yet the United States Treasury Department estimates the net profit of industry in 1941 was 8 billion dollars.

Obviously, if medical groups and management continue on the old plan of treatment only, there will be no reduction of this loss. Rather, the trend so far is upward. In one state, the accident frequency has increased over 100 per cent in the last year. The tension, longer hours of work, and rising costs of living are among the factors which have caused a 10 per cent increase in absenteeism in defense plants. If this condition is not rectified and the upward trend of accidents and illnesses continues—as it surely will as production becomes more intensified—not only will the economic loss increase, but it will be a greater handicap to the production of materials we so sorely need.

Management has learned to include these losses in the cost of production, which is reflected in the price of the product. Unfortunately, the wage earner is unable to make such an adjustment during sickness and the compensation he receives from occupational

injury is a poor substitute for good health and a full pay envelope. As a result, a vicious cycle is established—sickness stops his income, which lowers this family's standard of living. This not only lowers his efficiency as a worker but is manifested in the well-being of the entire family. It is axiomatic that the economic state has a direct bearing on general health.

The implication is obvious—preventive procedures if properly carried out will help improve the whole social structure.

It would seem that a program of such potential merit would progress rapidly. Unfortunately, interest in industrial health has only just begun and in a desultory manner up until the inception of the defense program. The attitude toward it now is the same as existed toward vaccination, immunization, and sanitation in earlier days. It is an attitude resulting from incomprehension of the meaning and value of preventive procedures in industrial health. No group, professional or otherwise, is entirely blameless. In relation to industry—the practising medical profession thinks in terms of traumatic surgery; nurses consider it in the light of first aid; except for industrial hygiene personnel, health departments think only of sanitation or cross-connections; managements' conception is that of accidents and insurance premiums; and labor—the real beneficiary—greet it with resistance or a feeling of persecution.

For many years there have been a few proponents of the preventive aspects of industrial health, but latterly with the realization of its proper position, new forces have been added to its development, and its scope is being defined. It has suddenly attained the dignity of a specialty.

In recognition of its reciprocal importance to the future of the medical profession, the Council on Industrial

Health of the American Medical Association was organized late in 1937. It has set down and promulgated the objectives and procedures of industrial health as a whole. An "Outline of Procedure for Physicians in Industry" was published by the Council in the *Journal of the American Medical Association*, March 14, 1942. It embodies the general principles and functions of industrial medical service. It states that—

... the purpose of medicine in industry is to promote the health and physical well-being of industrial employees, these objectives to be accomplished by:

1. Prevention of disease or injury in industry by establishing proper medical supervision over industrial materials, processes, environment, and workers.

2. Health conservation of workers through physical supervision and education.

3. Medical and surgical care to restore health and earning capacity as promptly as possible following industrial accident or disease.

There is nothing new in these statements, but they represent something which both physician and employer can catch hold of. Heretofore, it has been believed that these principles apply only to large institutions. Even so, many have not incorporated them. More important, the numerically superior small plants can and should have an equally complete program of industrial medical service. "The quality of medical service in industry should be uniform—the quantity only varying with the size of the plant." The first argument presented against such a thesis is economic—small industry cannot afford to enter into such a plan. There has not been enough evidence, by surveys or otherwise, to substantiate the belief that this type of service properly carried out is economically unsound. In the large plant a full-time physician performs examinations, treats injuries, and perhaps supervises plant hygiene and carries out health educa-

tion. New experiences are demonstrating that the cost should not be much greater if the required amount of service—commensurate with the size of the plant—is secured on an hourly basis from a private physician.

#### THE PHYSICIAN

Ideally, industrial health requires putting into operation in every plant adequate medical supervision, satisfactory to those who receive and those who supply the service. The real obstacle to this type of service for small plants—and the most difficult to overcome—is the lack of recognition by industry and the medical profession of the efficacy of preventive procedures. This does not imply that all large plants have an adequate medical service—quite the contrary. Many that would be justified by any standard in having a full-time medical service have only a physician on call in event of accidents, or one who comes into the plant for an hour or so and confines his attention to wrapping fingers or otherwise treating injuries. Ability to extend preventive services in these plants depends upon the vision and improved training for all physicians. The physician will not hesitate to relinquish the old for the new practices if their real significance is brought forcefully to his attention.

Returning again to the small plants—those too small to warrant full-time medical service. Those with less than 500 workers comprise over 90 per cent of the industrial establishments. It was stated that all of them could and should have an adequate service. The important thing is an appreciation on the part of the physician of the importance of prevention. He must realize also the relationship of working conditions and the health of the workmen. He need not be a trained industrial hygienist but he should know what, if any, operations or exposures may be present in the plant which may cause illness and what the

signs of such illness may be. To apply this knowledge he must be intimately aware of the physical details of the industry and the requirements of each process therein. In turn this knowledge enters into the decision as to the type of work a man is able to perform. It is fundamental to preemployment and periodic physical examinations, which are just as essential whether dealing with 100 men or 1,000. The physician who serves industry must be neutral, being neither unduly prone to ascribe to working environment conditions not readily accounted for, nor failing to recognize the evidence of occupational influence. It is an understanding of industrial etiology.

All studies to date indicate that industrial conditions cause only 10 per cent of the time lost from work because of physical disability, the remaining 90 per cent resulting from illness affecting the general population. Consequently the greatest loss to the worker, industry, and society as a whole is from this source. There are certain known facts having a bearing in this matter.

It was stated earlier that a manufacturer could save \$70 per employee by a 50 per cent reduction in absenteeism. Now it has been found in numerous plants that 12 to 15 per cent of the employees cause 55 to 60 per cent of the time lost by sickness.<sup>3</sup> In other words, this small group are sickness prone and should be the choice for concerted attention along prevention lines. If their record could be made to approach that of the remaining more healthy group it would be a notable achievement. And that is exactly what has been done in some plants. A study of their records indicated that some needed specific remedial work, and that all could be improved by general measures. By a plan of education, dwelling on nutrition and health measures and adjustments in relation to working requirements and shifts, the incidence of absenteeism in

this heretofore sickness prone group was reduced to the general level. Not only that—it was found that the entire plant population benefited and a considerable amount was carried into the homes by the workers.

#### INDUSTRIAL MEDICAL SERVICE

There are plans by which the small plant may organize a medical service. The physician in practice may call at the plant at stated hours and perform as much of his work as possible. This affords him the opportunity of becoming familiar to the employees and the conditions under which they work. Health lectures, first aid instruction, physical examinations, supervision of plant hygiene, and health consultation are duties he can carry out.

Another plan is the formation of a unit or group capable of rendering a similar service to a number of small plants. This has been carried out in modifications fairly successfully.

In Springfield, Vt., a working arrangement has been established whereby the physicians of the community spend time in two plants by rotation. It is a co-operative plan between management and the local profession. Apparently it is mutually satisfactory. It is reported that some of the doctors are so fascinated by the work that they spend considerably more than the stipulated time in the plant.

The important part of all these methods is that work is done in the plant. Probably no one method will serve the purpose of all areas, yet there are practical methods in operation. It behooves the medical profession to solve this matter. The time will come when management will rightfully expect that any physician worthy of caring for the injuries incident to the operation of a plant will have knowledge of and render preventive service. It will be a recognized responsibility. It has been found advisable to have one supervisor or

foreman to about every 10 workers—why should not comparable consideration be given to his health.

#### NURSING

Nursing is an important component of industrial medical service. Full-time nursing service is not only advisable but essential in all but the smallest plants. Its scope has broadened with the development of preventive procedures. No longer is the nurse's attention confined to first aid treatment. She is expected to take an active part in health education and within the limitations of her ability become interested in the correlation of the employee's physical condition and the influence of his surroundings while at work. And in this broadening lies the crux of the matter of developing preventive industrial nursing.

There are many nurses working in industry without background or training in prevention or health education. They have been carrying on well, within the limits of their understanding. Recently they have been confronted quite precipitantly with a movement which implies that for years they have been remiss in their duties as industrial nurses and that only those with public health training are capable of working in this new field.

This large group of nurses with years of experience in industrial relations should not be set aside but encouraged to broaden their activities to include this preventive phase of nursing. This may be done in the meetings of local nursing associations or clubs or by formal postgraduate courses offered now by a few schools. Unfortunately reports on these courses do not show a very high enrollment.

Part-time nursing service for small industries is receiving considerable attention in several areas throughout the country. There is a similarity in all the plans in operation in that the service is

offered on an hourly basis and that the duties of the nurse during these visits include health consultation, first aid, and supervision of conditions in the plant. It has been reported that the demands on her time usually increase. The organizations offering this service are usually staffed by public health nurses who may or may not have formal training or experience in industrial health.

The report of the American Public Health Association's Committee to Study the Duties of Nurses in Industry should reveal the proper plan for nursing service in small industries. It is certain that, to be of assistance in developing industrial health as a whole, any plan should be coördinated with all other phases under medical supervision.

#### HEALTH OFFICERS

There is one valuable group which has not universally taken up the cudgels for industrial health—health officers, including state commissioners. Notable contributions have come from a few. Unquestionably more would come if their interest could be focused in this direction. The task of technical service and industrial health promotion is too great in most states for the personnel allotted to bureaus of industrial hygiene. The field of industry contains some 50 million individuals whose health has a direct bearing on all the phases in which health departments are working. There is no field more fertile for tuberculosis case finding, nutrition, and health education, venereal disease control, and study of adult illnesses. One of the features distinguishing private practice from health departments is that one studies the individual and the other groups. The health department thinks about the incidence of disease in a community as a whole. But here is this large assemblage of workers—collected under one roof so to speak—that has received practically no attention as

such from the specialists in group health—the health officers.

#### THE WORKER

In reality in considering industrial health, the workers come first. Individually and collectively they are the prime beneficiaries. In fact, any program which does not achieve this end is certain to fail in time, for if the worker does not gain better health one way or another, none of the good we claim will accrue. This is a fundamental principle of industrial health—yet it needs to be promulgated among all interested agencies, and particularly among wage earners. Many plans for health education in industry have been set forth. None to date has utilized the influence of workers' organizations.

Too frequently we encounter the attitude that the wage earner is opposed to health plans. In some instances this is true, but is usually due to a lack of understanding of the objectives, or an unsound plan. In no program properly conceived can this be considered an insurmountable obstacle. Some form of representation of the wage earner should be included in the planning and execution of every program of industrial health.

#### THE EMPLOYER

"The worker being the prime beneficiary—the employer is the number one consumer of industrial health." If the employer is not interested to the point of expanding his program, obviously there is no market. He is the one who puts programs into effect. The only areas which have made significant progress are those working intimately with a local industrial organization. The signal success of such a working arrangement in Connecticut is outstanding.

These groups, then, the workers, employers, nurses, the medical profession—industrial and practising physicians, health officers, and industrial hygien-

ists—are the main parts in the structure of industrial health, each fitting into its proper position. But as organizations each needs assistance in making effective its efforts in relation to all others. While it may appear that each phase is an entity, there is an actual multiple interlocking dependence which makes each unit or phase necessary to a properly integrated whole. It is recognized that there are other interested parties that may contribute materially, such as safety and personnel organizations, insurance companies, industrial commissions, rehabilitation agencies, and voluntary health agencies.

The extension of industrial health requires leadership at state and local levels to bring about concerted effort. Industrial health should center in the medical profession, and that includes every specialty—health officers and industrial hygienists not excepted. As matters have progressed, the Council on Industrial Health has become more impressed with the responsibility placed upon the medical profession by the leadership in industrial health. The program outlined for both state and county committee activity consists of:

1. Organizing and carrying out a plan of activity
2. Educating the medical profession and industry in preventive measures as applied to the worker
3. Coördinating the efforts of all agencies

The Council has recommended that the membership of all coöperating state and local committees include representation from the local bureau of industrial hygiene or the health department. In the formative stage it was felt that their technical training and close association with industry would be of valuable assistance to such committees. This belief has been justified. Programs on industrial health have been enhanced wherever coördinated effort has been applied, particularly since the viewpoint has broadened from that of occupa-

tional disease control. This coöperative activity should not be confined to medical industrial hygienists. Plant management has learned to turn to the bureaus for advice in environmental control. This is an ideal opportunity for outlining a well rounded medical service and more industrial hygienists should capitalize on it.

At present industrial health is faced with an emergency which can only be met by the balanced development of a program. By fulfilling these requirements a structure will have been built which will assure the future of industrial health.

The indicated course of action to meet the war emergency and develop a long term program is—

1. Promulgation of the modern concept of industrial health among and by all interested agencies

2. Education of the personnel necessary to supply this service

3. Coördination of all activity in such a manner as will assure even development and mutual assistance

The responsibility of the medical profession and allied groups to apply modern industrial health measures supercedes all non-military demands on their ability. The recognition and discharging of this responsibility is the greatest contribution they can make toward the successful completion of this war.

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# Dissolved Air as a Source of Error in Fermentation Tube Results

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IN the course of a comparative study of media for detecting the presence of coliform organisms in water, it was remarked that bubbles of gas were appearing with suspicious frequency in Durham fermentation tubes of an experimental medium which previously had yielded satisfactory results. The medium in the great majority of the tubes containing these gas bubbles was clear or only slightly turbid, and upon transfer from such tubes to eosin-methylene-blue agar, either no colonies, or atypical colonies that failed to ferment secondary lactose broth, developed on the plates.

A closer study of these abnormal results revealed that they first appeared after a slack, mid-winter holiday period of about 15 days. Since the tubes of medium then employed had been in the refrigerator more than 3 weeks, and since the gas bubbles formed upon incubation did not seem to be the result of bacterial fermentation of the contained lactose, it was suspected that these apparently false presumptives might be due to the liberation, upon incubation, of air that had been dissolved by the medium during the extended period of storage at the low temperature. This suspicion appeared the more justifiable because the experimental broth had been kept in the refrigerator to prevent excessive evaporation, whereas the other media, which had caused no difficulty, and the supplies of which are frequently renewed because of their constant use

in routine work, had been kept at the room temperature of the laboratory. Obviously, the conditions under which the experimental broth was stored were conducive to concentrations of dissolved air greater in the experimental broth than those to be expected in the other media.

Fortunately the validity of this explanation of the suspected false presumptives was susceptible of immediate proof, for a few tubes of the lot of experimental broth that had been employed still remained in the refrigerator. Upon overnight incubation of these tubes at 37° C., gas formation was observed in nearly two-thirds of them, the diameter of the bubbles in some being as large as 2 mm.

This interesting observation led to a study of the solubility of air in broths of various concentrations at different temperatures. Lactose broths, of one, two, and three times the usual concentration employed in water work were prepared, distributed in bottles of 5 cm. diameter, 100 ml. in each bottle, and autoclaved at 15 lbs. for 15 minutes. The dissolved oxygen in the contents of one bottle of each concentration was determined by the Winkler procedure\* of Standard Methods immediately after sterilization and after 4, 7, 11, 16, 22,

\*Although the routine Winkler method perhaps does not yield strictly correct results when applied to lactose broths containing various concentrations of organic matter, it was considered sufficiently precise for the purpose of this study.



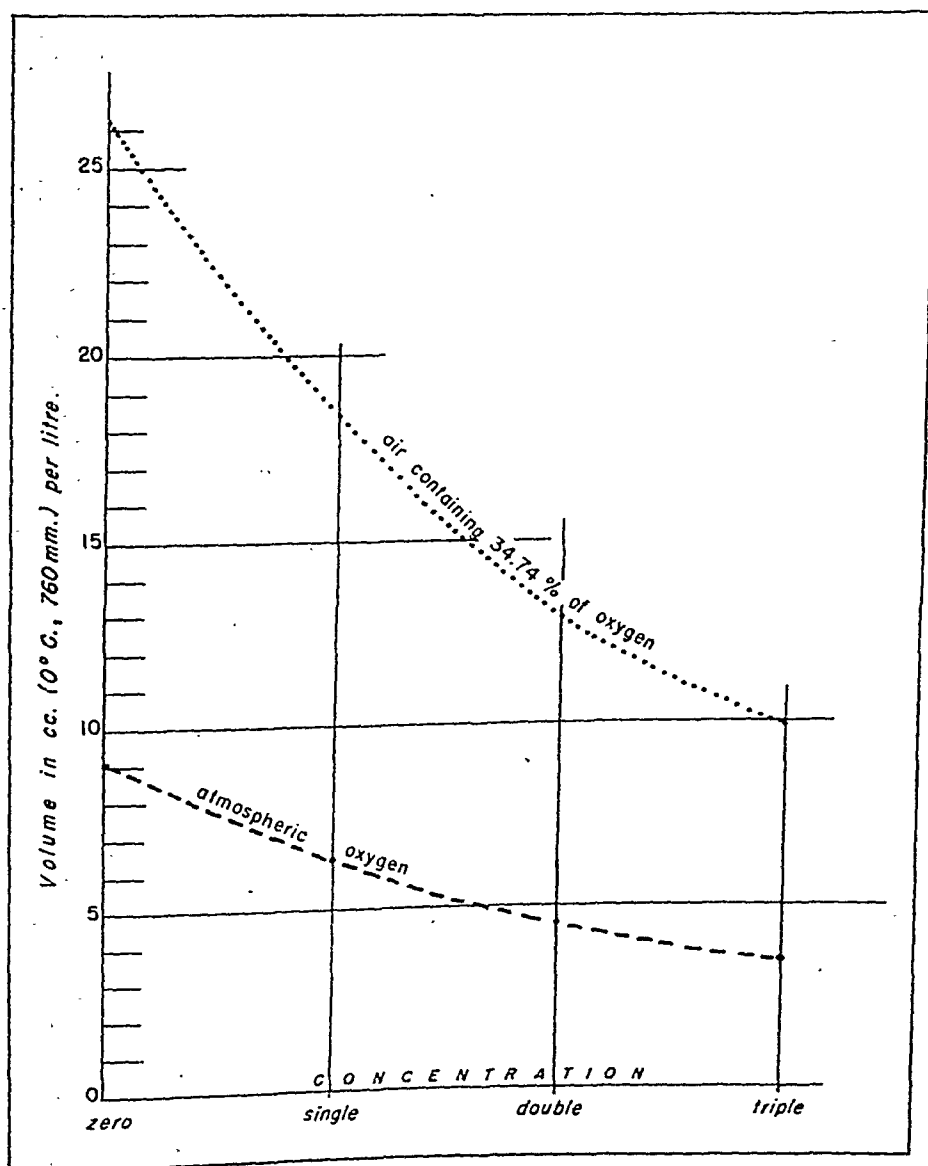
and 42 days of storage in the refrigerator at approximately 4° C.

The dissolved oxygen contents of all the broths were found to increase, from very low figures immediately after sterilization, to maxima (saturation) in the 4 day samples, the results of subsequent tests remaining practically unchanged. The amounts of dissolved oxygen found were 9.2 mg. per liter in the single strength broth, 6.4 in the double strength broth, and 5.0 in the

triple strength broth. These figures express approximately the solubility of atmospheric oxygen in these broths at a temperature of about 4° C. Figure 1 shows graphically the same results in ml. per liter (0° C., 760 mm.); the curve has been completed by indicating also the volume of atmospheric oxygen that water alone, which may be considered as a broth of "zero concentration," can dissolve at the same temperature.

Figure 1

*Solubility of atmospheric oxygen and of air in lactose broths of different concentrations at the temperature of 4° C.*



Included in Figure 1 is a second curve, calculated from the oxygen figures on the assumption that the volume of dissolved oxygen is 34.74 per cent of the dissolved air at 4° C. (composition of air in water saturated at this temperature), showing the approximate volume of *air* that may be dissolved in these broths. This hypothetical curve indicates not only the effect of the concentration of the medium on the solubility of air, but also the appreciable volumes of air that broths of various concentrations may be expected to dissolve at the temperature of the refrigerator.

When considering the application of the above data to bacteriological laboratory practice, however, many factors must be taken into account. It is well known that the solubility of a gas in a liquid decreases with a rise in the temperature: broth kept at a low temperature will hold in solution a larger volume of air than will broth kept at a higher temperature. Consequently, the volume of air that may be liberated from a broth upon incubation depends upon the difference between the incubator temperature and the antecedent storage temperature. The possibility of the occurrence of the phenomenon known as supersaturation must also be considered.

Furthermore, the conditions in a fermentation tube are very different from those under which the experiments described above were conducted. Although the medium in the bottles employed rapidly became saturated with air when held at a low temperature, it is improbable that the medium contained in the vial of a Durham fermentation tube will become saturated so quickly. It is obvious that any air dissolved at the surface of the medium in the outside tube must, in order to reach the vial, be transported, by diffusion or by currents caused by differences in density due to dissolved air or to temper-

ature, first to the bottom of the tube and then into the vial. The transfer from the surface to the bottom of the outside tube may be effected rapidly; but the rate of passage of the air into the vial will depend upon the size of the opening between the rim of the latter and the bottom of the outer tube: if the opening is small, the air will pass very slowly, probably almost entirely by diffusion, from the tube to the vial. If, on the other hand, the opening is comparatively large (as when the rim of the vial is broken, or when the vial is in a slanting position), the rate of passage into the vial will evidently be greater.

In order approximately to determine the conditions of time and temperature required for dissolved air in fermentation tubes of broth to attain concentrations which result in liberation of visible gas when the tubes are incubated at 37° C., further experiments were made. Supplies of lactose broths of various compositions, distributed in tubes of different sizes and types, and autoclaved in the usual manner, were stored at certain temperatures. From time to time, a few of the tubes were taken at random from each lot and incubated at 37° C. After 24 hrs., and again after 48 hrs., they were examined and any gas formation was recorded. The results obtained are summarized in Table 1.

These results show very clearly that if fermentation tubes of the broths indicated are held for an extended period at a low temperature, the air dissolved may cause, upon incubation at 37° C., the formation of gas bubbles in the vial of the Durham tubes or in the closed arm of the Smith tube. Bubbles were observed in a large proportion of the incubated tubes, both in lactose broth held at 4° C. and in the experimental broth held at 13° C. None of the tubes, however, that were stored in two locations, the temperatures of which varied from 16° to 24° C. and from 24° to 27° C. respectively,

TABLE 1

*Effect of Time and Temperature of Storage of Lactose Broths on Fermentation Tube Results When Subsequently Incubated at 37° C.*

Type	Tubes Diam. in mm.	Volume of Broth	Media	Storage Temperature	Storage Period in Days	Results upon Incubation *	Storage Period in Days	Results upon Incubation *
Durham	25	20 ml.	Lactose broth 1½ times strength	4°	6-18	0/12	22-35	5/12 = 42%
					12	0/3	27-56	2/15 = 13%
					7-13	0/6	27-71	18/24 = 75%
				16-24°	6-35	0/36		
					12-56	0/18		
					7-71	0/34		
Durham	20	10 ml.	Lactose broth single strength	24 27°	6-35	0/28		
					12-56	0/18		
					7-71	0/36		
				4°	—	—	7-41	9/16 = 56%
					2-14	0/36	15	1/4
					7-41	0/16		
Smith	15	5 ml.	Lactose broth single strength	16 24°	7-41	0/16		
					7-41	0/16		
					7-41	0/16		
				4°	1-7	0/30	8-24	16/65 = 25%
					4-9	0/30	10-27	18/64 = 28%
					4-9	0/30	10-27	18/64 = 28%
Smith	20	35 ml.	Lactose broth single strength	4°	1-7	0/30	8-25	3/70 = 4%
					6	0/5	7-29	11/90 = 12%
					6	0/5	7-29	11/90 = 12%
				13°	1-4	0/12	7-17	4/27 = 15%
					1-4	0/12	7-17	4/27 = 15%
					1-4	0/12	7-17	4/27 = 15%
Smith	15	15 ml.	Lactose broth single strength	4°	4	0/2	9-30	18/20 = 90%
					4	0.1	9-27	9/9 = 100%

\* Denominator = Number of tubes incubated  
 Numerator = Number of tubes containing a bubble of air

showed gas formation upon incubation, even after storage periods of 35 to 71 days.

The minimum holding period that resulted in liberation of visible gas in the fermentation tubes of broths of normal concentration upon incubation at 37° C. was 7 to 10 days, with the exception of one lot in which no bubbles appeared before 15 days of storage.

An increase in the concentration of broth, at least when Durham tubes are employed, apparently lengthens the period of storage required for production of visible gas upon incubation. In tubes of broth of 1½ times the normal concentration no bubbles appeared upon incubation until the storage period was extended to 22-27 days.

It is interesting to note, in the last column of Table 1, that the proportions of tubes with visible gas vary greatly,

even when media of the same composition and concentration, and stored at the same temperature, are employed. This variation is due to several causes: different storage periods, different initial contents of dissolved air after sterilization, and different sizes and positions of openings between the rim of the vial and the bottom of the outer tube of Durham fermentation tubes, and between the open and closed arm of Smith tubes. The results obtained from Smith tubes deserve particular mention: evidently because of the large opening between the open and closed arm, gas bubbles appeared upon incubation of practically all of these tubes after a storage period of only 9 days at 4° C.; moreover, as might be expected because of the comparatively large volume of liquid contained in the closed arm of these tubes of the usual

type employed in water examination, the bubbles of gas produced therein were of considerable size.

Since the solubility of air in water at  $37.5^{\circ}\text{C}$ . is only about 13.8 ml. ( $0^{\circ}\text{C}$ ., 760 mm.) per liter, whereas that at  $4^{\circ}\text{C}$ . is 26.32 ml., it is evident that if the solubility of air in a broth were the same as the solubility in water, the liquid contained in the vial of a Durham tube or the closed arm of a Smith tube, when saturated with air at  $4^{\circ}\text{C}$ ., might release upon incubation a volume of the gas equal to more than 1 per cent of its capacity. Although the solubility of air in a given broth is not exactly that in water, but varies with the composition of the broth, the results of the experiments described establish beyond doubt the important fact that the solubilities of air in various broths are such that visible gas may be released when these broths, after previous storage for several days at a low temperature, are subjected to incubation at  $37^{\circ}\text{C}$ .

The practical importance of the possible effects of storage at comparatively low temperatures of fermentation tubes which, subsequently, are to be incubated at higher temperatures, is self-evident. Bubbles of air resulting simply from a change in temperature may deceive the laboratory worker into believing the gas thus formed to be the result of bacterial fermentation. Not only in the bacteriological examination of water, milk, etc., but also in the differentiation of species of bacteria by means of tests for gas production in sugar media, the possibility of this source of error must be guarded against.

Consequently, in order to prevent the occurrence of false fermentation tube results, there must be added to the usual precaution of avoiding the conversion, by the heat of sterilization, of the fermentable constituents of the medium employed, that of preventing such concentrations of dissolved air in the

medium that visible gas will be released upon incubation. To this end fermentation tubes should be stored at temperatures not far below that of  $25^{\circ}\text{C}$ ., and be used after only a limited period of storage. If storage of such tubes at lower temperatures for longer periods is unavoidable, however, they should be incubated overnight, and carefully inspected, and those observed to contain air bubbles discarded before use.

#### SUMMARY

The results of experiments with lactose broths of various compositions contained in fermentation tubes have shown that, when such tubes are stored for a sufficient time at a low temperature, a large proportion of them may contain dissolved air in such concentration as to produce, upon incubation at  $37^{\circ}\text{C}$ ., visible bubbles of gas.

Seven days of storage of single strength lactose broth at  $4^{\circ}\text{C}$ ., or even at  $13^{\circ}\text{C}$ ., sufficed for the production, upon incubation at  $37^{\circ}\text{C}$ ., of visible gas in some of the fermentation tubes.

The frequency with which gas bubbles may thus be produced depends upon several factors: (a) the initial concentration of dissolved air in the broth immediately after sterilization; (b) the concentration of the ingredients of the broth; (c) the size and position of the opening between the vial and tube of the Durham tube or between the open and closed arm in the Smith tube; (d) the difference between the temperature of storage and that of final incubation; and (e) the duration of the storage period.

In order to avoid errors in fermentation tube results due to dissolved air, the tubes should preferably be stored at temperatures approximating  $25^{\circ}\text{C}$ . and, since evaporation may proceed rapidly at such temperatures, they should be used after only a limited period of storage.

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## THE AMERICAN PUBLIC HEALTH ASSOCIATION MEETING THIS MONTH

IT is very nearly an unwritten law that in the fall of each year the Editor of the JOURNAL beat with vigor the bushes of Association membership, to the end that the old dogs and the cats and the bears, and the dears and the foxes and the rabbits and the rats of public health all go lumbering, or hopping or scurrying, as befits their station, to the Annual Meeting of the Association. And aside from bushes-beating, certain bait, differing from time to time, is set out: the increase in knowledge that comes from such attendance; the broadening of acquaintanceship; the celebrities to be seen and, inevitably, heard; the meeting of old friends; the coming together of North, South, East, and West, Canada, Mexico, Central and South America. Sometimes even, in this attendance-getting effort, guarded reference is made to the sociability to be found, if one knows where to look for it, when austerity goes out the window and back hair comes down. These benefits and pleasures are parts of any annual meeting of any association, where people with common interests gather: serious, scientific and orderly sessions, plus a decent after-hours gaiety.

For the meeting to be held in St. Louis the latter part of this month we beat no bushes, we set no bait. Nor have we any desire to give a light touch to the soberness of the occasion. The mere fact that the meeting is to be held, in spite of war conditions, is testimonial to its seriousness of purpose and to its necessity. Some five to ten years ago, when routinism was pretty deeply rutted, it probably would not have mattered much if an annual Association meeting had been cancelled, unless that particular meeting would have pulled things out of the rut. Today the situation is on the one hand encouragingly different and on the other distressingly so. Public health workers are faced, as never before, with many new and many more problems. Shifting of populations, concentration of troops and war industries, depletion of the ranks of practising physicians, losses of personnel on public health staffs—all these things have changed the tempo and confused the situation. There is another problem, too, that needs attention. It is this: No longer is it sensible or practicable to regard the public health activities or the stand-

ards under which they are performed, the recruiting and training of personnel, or the problems of finance as being entirely prerogatives and obligations of the locality in which this health department or that operates. In all the nations of the world today, and probably for a long time to come, life and living must be in terms of national economy and national effort. To function on such a basis, public health work must be retooled, for although coördination between federal, state, and local health agencies has in the past been rivaled only by similar coöperative effort in agriculture, and has far surpassed that of other governmental bureaus, direct public health service is still geared essentially to the existing pattern of state and local governments. Serious thought, therefore, needs to be given to those adjustments which, without destroying the basic structure of state and local responsibility, will permit and assure national influence and assistance in meeting problems wider than state boundaries.

These things are to be discussed at the meeting this month. Only through contributions from all the far reaches of this country and this hemisphere can a wise course be plotted.

## TO A FEW GOVERNORS AND MANY POLITICIANS

**G**OVERNOR, why in Heaven's name can't you keep your hands off your department of health? Surely, in calling a physician to treat a member of your family, you would not be guided by the advice of a political campaign manager, nor would you be influenced by the fact that one doctor is a Democrat and another a Republican. If your child had pneumonia or were otherwise seriously ill, you would not wait to find out how this physician or that had voted in the last election or how much he is likely to contribute to the next campaign fund. And, having a family physician, you would not, certainly, change to a less competent one merely because you found that he had been unwilling to perform some political chore for your good friend Senator Soandso. No, one who has sense enough to attain leadership in political affairs doesn't engage or dismiss a private physician as a matter of political expediency, because the danger of disaster is too close home. But have you ever thought, Governor, of the responsibility you assume in the hiring and firing of the state health officer and other personnel in the health department of the state for whose health and well-being you bear the ultimate responsibility? It is not a matter to be taken lightly, nor is it one that can be settled by paying a political debt.

Illnesses and deaths which occur because of unwise decisions and acts on your part, sir, are, of course, way out on the fringes of things, too far off and too intangibly related to your affairs ever to be recorded on the debit side of your record. Nevertheless, these catastrophes exist as grim effects of definite causes. An incompetent worker here, a political-minded appointee there, through ignorance or dereliction of duty or even by sheer laziness, may set in play a chain of events that will as surely result in disaster as would a fumbling surgeon in the operating room. Or the untrained health officer, for want of knowledge as to the conduct of a modern health program, may, by omission, permit unnecessary sickness and funerals. An incompetent laboratory worker may fail to discover the danger in a water sample or may read incorrectly the picture under the microscope, or misinterpret the story told in a test tube. These things, sir, are not dramatic, are seldom discoverable, and sometimes will occur in spite of every precaution.

But, Governor, is it not your responsibility, your opportunity, to appoint to positions in your health department only those persons in whom sins of omission and commission are least likely? And who are these persons? The answer is not difficult. They are those who by training and experience in public health work and by personal integrity have demonstrated professional competence, sound judgment, and trustworthiness. Many of them are already in your department of health. They are faithful, diligent workers, jogging along on low salaries, never at political rallies, unknown to your organization, asking only to be permitted to do their jobs. *Governor, please, in all decency, leave such people alone!* Sometimes, the person you will need for a particular job may live a thousand miles away. If he does, sir, will you bear in mind the fact that competence and incompetence are not determined by state boundaries. If in your own state you cannot find the right person, don't pull the work down to the level of whatever or whoever is available among registered voters.

The protection of the public health is a serious job, and a hard enough one at best. At present, many of the most competent workers must be yielded for military duty, because they are young and robust, and the Army and the Navy need them. At this time, then, above all, don't throw your political weight about in the health department. If there are incompetents on the job—and no one can deny that there are some—they must be rooted out. But in discharging such persons, first get a good state health officer, or *keep the one you have if he is competent*, and let him make the decisions on the basis of their records and in accordance with the merit system which it is to be hoped you have provided or will adopt.

We ask this, Governor, not so much for those who might have lost or might lose their health department jobs for political reasons. Though such unfair treatment is hard on them as individuals, their plight is relatively unimportant. But we do ask for competent public health workers for the sake of the people who look to you for wisdom and protection. Further, Governor, if you are one of those inclined to regard health department jobs as part of a patronage pool, please be advised that years ago this went out of fashion, even in the realm of political expediency. It is generally regarded as poor politics, lacking in finesse, and likely to be resented by the better element among your constituents, particularly by the women. The latter can raise the devil of a row about that sort of thing, and they don't care what they say, or to whom or when or where they say it. And, finally, sir, those governors who play politics in health departments constitute only a rapidly dwindling minority. If you do this and keep it up you are going to find yourself alone, unhonored and unsung, maybe un-officed.

P.S. Your personal physician is not likely to make a good state health officer.

## BOOKS AND REPORTS

**Health Education of the Public—** By W. W. Bauer, B.S., M.D., and Thomas G. Hull, Ph.D. Foreword by Morris Fishbein, M.D. (2d ed.) Philadelphia: Saunders, 1942. 315 pp. Price, \$2.75.

The preparation of a useful handbook for health education is a large task; a revision is far from simple, requiring initiative and perspective. The second edition of this instructive and practical volume reveals imagination and judgment in the selection of illustrations and an insight into the needs of both the field worker and the instructor in the clear presentation of subject matter.

In bringing their well known book up-to-date, the authors, well equipped for the task, added new chapters on a Philosophy of Health Education and on Training and Qualifications, besides featuring a study of words habitually used by doctors in writing for the public. Chapters on health meetings, motion pictures, exhibits, radio, and the newspaper have been revised; chapters on stereopticon slides and on correspondence contain many helpful suggestions; a discussion of measurement of results should promote further study in this important phase of the subject. Anyone engaged in community health education, whether as administrator, specialist, student, or teacher, will find valuable assistance and stimulus in this new edition.

IRA V. HISCOCK

**Essentials of Nursing—**By Helen Young. New York: Putnam, 1942. 609 pp. Price, \$3.00.

This book is written by a group of authors who worked together in teaching nursing arts in the School of Nursing which is connected with the Pres-

byterian Hospital in New York City. The school was founded fifty years ago by Anna C. Maxwell, and this volume is prepared as a tribute to her. It will also be a memorial, for all the royalties are to be devoted to the scholarship fund of the Alumni Association.

There is significance in the fact that the central theme of *Essentials of Nursing* is the patient. All through the book emphasis is placed on contact with the patient, and the reaction of the patient to treatment is given importance.

While written for teachers of nursing arts and their students, the book will be of equal or greater value to the graduate nurse as a reference book. The illustrations are numerous and excellent, and technics are in sequence and logically described.

The material on nursing patients for communicable diseases is particularly well done as is that on nursing patients on whom a tracheotomy has been performed.

All procedures in surgical nursing are especially well described. Obstetrical nursing and charting, perhaps by contrast, appear to have been somewhat neglected.

For the student nurse it would have been desirable to have given more attention to principles underlying procedures, but for the graduate it is entirely adequate.

ELNORA E. THOMSON

**A Handbook for Assistant Medical Officers of Health on Child Welfare and School Medical Work—**By F. J. G. Lishman, M.D. London: H. K. Lewis & Co., Ltd., 1942. 61 pp. Price, \$1.50.

This handbook was prepared to guide junior medical officers who



were added to the staff of the Devon County Council, England, as a result of the migration in 1939-1941. It will give American public health officials a brief but satisfactory account of procedures in the Maternity and Child Welfare Centres and School Medical Services in England. The Welfare Centre is described as primarily educational. Ten minute talks to mothers by the Medical Officers are mentioned, and printed instructions are recommended to be issued singly at appropriate intervals.

The School Medical Service is given the major attention and shows the tendency in England as in this country to use the observations of teachers and principals to select children in need of medical attention. There is, however, more emphasis on routine examinations than is recommended by the latest American viewpoint. Twelve examinations per hour including parent conferences, is described as normal practice, but a rate of six per hour is mentioned as "necessary for adequate discussion of the child's health with the parent." School clinics for treatment of "minor ailments" are described as more efficient than referring children to the family doctors. "Curiously enough," says the author, "children suffering from otorrhoea are also considered to have a minor ailment."

Procedures and records are outlined sufficiently to indicate the routines of practice but they do not make clear the educational possibilities of the services. The Appendices containing "model leaflets" for parents are an interesting feature indicating some advice not altogether consistent with our best American practice. HAROLD H. MITCHELL

**The American Pocket Medical Dictionary**—By W. A. Newman Dorland. (17th ed.) Philadelphia: Saunders, 1942. 1037 pp. Price, \$2.00; thumb indexed, \$2.50.

A compact and well edited dictionary, with definitions usually clear and to the point. In the communicable disease field the information is reasonably up-to-date, though transition from the old bacterial nomenclature is incomplete. Considering the inherent difficulty in such condensation, it is well done. REGINALD M. ATWATER

**Sex Guidance in Family Life Education: A Handbook for the Schools**—By Frances Bruce Strain. New York: Macmillan, 1942. 340 pp. Price, \$2.25.

Mrs. Strain has made an outstanding contribution to a field that has been full of confusion for well over forty years. The need of getting away from the disastrous Victorian silences was met by enthusiastic converts who plumped over backward for detailed biological lectures to young children. Now that parents are rather generally ready to use the help of the school, the educators must be able to furnish realistic answers to the questions that start out with irreconcilables. This book is addressed directly to school people, who have been acquiring a sense of obligation regarding "sex education" but without being able to discharge it in terms of curriculum, content and methods, and other school categories. Here they are told *how*. Some of the main topics treated are: Gaining Community Support, Matters of Organization, Needs at Various Age Levels, Personal and Academic Qualifications of Teachers, and Counseling Center.

Mrs. Strain's book presents a sound philosophy regarding the functions of schools and homes in the child's education, and clarifies the issues which underlie most of the confusion. As one of the few persons who have been able to try out the possibilities of the school, she can speak to teachers in their own language. The book is full of concrete suggestions as to procedures, without

being dogmatic as to "subject matter," and without descending to the fallacy of offering "techniques of instruction." Indeed, one of the valuable features of this treatment is its help in clarifying for teachers the possibility of guiding educational procedures through a dynamic understanding of young people and children, rather than formal rules of teaching. This will be a valuable aid in orienting schools toward children as members of families and as prospective founders of families.

SIDONIE MATSNER GRUENBERG

**Prostitution and the War (Public Affairs Pamphlet No. 65)—By Philip S. Broughton. New York: Public Affairs Committee, 1942. 32 pp. Price, \$.10.**

This excellent publication issued by the Public Affairs Committee of New York presents the problem of prostitution from a public health point of view rather than dealing with the moral aspects of the problem. The age old question of segregation and examination of prostitutes as a means for the control of venereal diseases is directly handled. No shadow of a doubt should remain in the reader's mind as to the incompatibility of this procedure with the reduction of the incidence of venereal diseases.

The amount of exposure which is experienced by a prostitute in an open house of prostitution is clearly shown. The average prostitute has from 25 to 40 sex exposures in her working day and this may be increased to as many as 60 to 65 on busy days. Such a woman obviously acts as a mechanical vector of syphilis and gonorrhea and is not necessarily afflicted with the disease which she spreads. Such conditions are not compatible with medical examination. The mere closing of open houses of prostitution lowers the venereal disease rate of a community because the number of sex exposures of

a prostitute operating as a street walker rather than in an open house of prostitution is reduced from 25 to 40 exposures to from 2 to 4 exposures in each working day.

The material is presented in very logically arranged form explaining the responsibility and function of the various official agencies from a national and local level, the problem of prostitution, the social responsibility of the community, and the national need for local action. Specific local experiences with problems under discussion are offered to strengthen the various points presented.

This important publication should be read by every law enforcement officer in the country and it should prove to be of great assistance to venereal disease control officers and venereal disease control public health nurses in selling repression of prostitution to their local communities.

J. C. GEIGER AND RICHARD A. KOCH

**American Foundations and Their Fields—Compiled by Geneva Seybold. New York (330 W. 42nd Street): Raymond Rich. Associates, 1942. 274 pp.**

Once again Medicine and Public Health head the list of purposes for which grants were made in 1940 to various fields by 134 American Foundations.

A total of 12¼ millions went to these purposes in the latest year of record, amounting to 30.4 per cent of all the grants by foundations. Education, Social Welfare, the Physical and Biological Sciences, and the Social Sciences follow Medicine and Public Health in that order. Grants to religious purposes now stand at 3 per cent of the total, whereas fifty years ago these topped the list.

This volume, the fifth in the series, is again prepared by Raymond Rich Associates of New York and is much

the most comprehensive review available. The activities of 314 foundations, with total capital funds in excess of one billion dollars, are included. Even this is not all the so-called "foundations."

A wealth of information is available regarding these agencies, their fields, their officers and directors, and the expenditures of their funds. A highly recommended volume.

REGINALD M. ATWATER

**The Fundamental Principles of Mathematical Statistics:** *With special reference to the requirements of Actuaries and Vital Statisticians*—By Hugh H. Wolfenden. New York: Macmillan Company of Canada, for the Actuarial Society of America, 1942. 379 pp. 35 diagrams. Price, \$5.00.

This book attempts to assemble and coördinate those portions of the theory and applications of mathematical statistics which are needed by actuarial beginners and by qualified actuaries. Essentially it is an exposition of the subject of probability in the classical manner, with emphasis on the theory of errors and least squares. The arrangement of the material is novel in that the main text is a condensed presentation largely devoid of mathematical proofs and applications. These aspects are reserved for separate sections of the book, one on *History*, a second on *Mathematics and Interpretations* containing proofs, and a third on *Applications*, particularly to actuarial data. The Bibliography of 367 references is divided into two parts to denote historically important and currently useful publications.

The exclusion from the main text of the treatment of history, mathematical proofs, and applications inevitably leads to a degree of discontinuity. The reader interested in all aspects of a given topic must refer continually from section to section. This reviewer feels that the bird's-eye view of statistics

given in the main text is inadequate for an elementary student without considerable mathematical attainment and that a mathematically versed student would prefer to have the later sections appropriately inserted.

The usual ideas on probability are presented, leading up to the point binomial and its approximation by ordinates and areas of the normal curve. The use of the modulus of the normal curve instead of the standard deviation will seem awkward to many readers. The various types of sampling of attributes, as Bernoulli, Poisson, Lexis, and their relation to the chi-square test of heterogeneity are discussed. The sampling theory of means and standard deviations for large and small samples are adequately treated, but it is unfortunate that the distinction between the theory appropriate for the sampling of attributes and that of measurements is not more sharply drawn.

There is the usual treatment of systems of frequency curves, including those resulting from scale transformation. The author also discusses curves of particular interest to the actuary, as the life table functions, mortality laws, laws of population growth.

The author takes up in some detail topics considered only briefly or not at all in many treatises on mathematical statistics. These include a demonstration of the standard errors of functions of a variable, in some cases by the use of a Taylor's Series. Thus he evolves the standard errors of the life table functions. Consideration is also given to the multinomial law and its relation to the normal surface and to chi-square. There is an excellent discussion and comparison of various methods of curve fitting and graduation, as maximum likelihood, least squares, moments, minimum chi-square, together with criteria for testing goodness of fit. Another unusual feature is the presentation of the method of fitting transcen-

dental trends by the use of Taylor Series.

Some of the more recent advances in mathematical statistics, as confidence limits, testing of hypotheses, analysis of variance, are mentioned only briefly.

This book should be an exceedingly useful reference manual to the vital statistician, since many of his special tools are given more adequate treatment here than in most works on mathematical statistics.

JOHN W. FERTIG

*Handbook of Hygiene—By Joseph W. Bigger. (2d ed.) Baltimore: Williams & Wilkins, 1941. 414 pp. Price, \$4.50.*

This book, intended primarily for medical students, contains 404 pages of text and 10 pages of index. It is well arranged, the material is presented in a clear-cut and concise manner and with a commendable directness. It reflects the points of view prevailing in Great Britain and, in general, the illustrative data are drawn from abroad. For American readers this is not disadvantageous as it tends to broaden the horizon.

However, the abbreviations on pages 64 and 65 for biologic agents used in immunizations are meaningless to most American readers. Apparently, American and British experience is not parallel as to the frequency of positive Mantoux tests among adults. Because of the imperfections in the system of compulsory vaccination in Great Britain, and the admitted dangers involved in the measure, the author questions whether vaccination might better be restricted to actual exposures in a country where the disease is not endemic. This assumes the existence of an alert, efficient, and integrated system of local health services, which we do not have in the United States. Even if but half of a population has a relative immunity to the disease, this constitutes a barrier of no mean value.

In view of the serious problems created by acute types of encephalitis in the United States, our medical students will find the chapter limited to encephalitis lethargica particularly inappropriate.

Concerning pulmonary tuberculosis the author states (page 82) "From the point of view of prevention, it is sufficient to know that the bacilli enter the body with inspired air contaminated either by droplets or dust." One is permitted to doubt that this statement as it stands is adequate.

In the chapter on disposal of wastes, the scant mention of the problem of back-siphonage leaves the reader completely uninformed as to the importance of this subject.

These and other points which might be mentioned do not detract from the value of the book as a whole. For its intended purposes, it must be rated as among the best of its type.

M. E. BARNES

*Stedman's Practical Medical Dictionary—Edited by Stanley Thomas Garber, B.S., M.D. (15th ed.) Baltimore: Williams & Wilkins, 1942. 1,257 pp. Price, \$7.00; with thumb index, \$7.50.*

One cannot review this volume as one would an ordinary text, for the excellence of a medical dictionary depends upon how well the editor has met standards of which the average professional worker is quite ignorant. Obviously there are complex etymological requirements, precedents, and usages that must be observed in such a task, and the lexicographer too must make many difficult decisions not covered by rules. It is not easy to attempt order and consistency and at the same time hold inviolate the terminologies arising from separate, independent, highly authoritative sources: the Pharmacopea, the Basle Anatomical Nomenclature, Zoölogical, Botanical, Bacteriological,

and Chemical Nomenclature, to say nothing of those dealing with Nosology.

Stedman's has always been one of the better medical dictionaries, and in the fifteenth edition Dr. Garber, the present editor, seems to have met these various problems expeditiously and completely. The new type is pleasing to the eye and, by appropriate contrast in boldness and size, guides one quickly to major headings, sub-headings and interpolations. With a publication date of June, 1942, the contents are inclusive and fresh.

H. S. MUSTARD

**War Gases**—By Morris B. Jacobs, Ph.D. New York: Interscience Publishers, 1942. 180 pp. Price, \$3.00.

With the threat of an attack on our shores growing daily, the problem of defense against chemical warfare agents becomes an important one. The publication of this concise reference handbook on the war gases is therefore very timely.

The problem of war gases is approached from the point of view of the analytical chemist. The physical and chemical properties of the war gases are concisely and completely presented. The analytical procedures are arranged after the fashion of laboratory handbooks and are easily accessible. The book is of limited use to those concerned with the medical aspects of chemical warfare, since it contains little or nothing concerning the pharmacological or pathological aspects of chemical warfare agents.

The reviewer, who is not an analytical chemist, has been informed by qualified individuals that the material is accurate and that all modern available information has been carefully and accurately recorded, although lack of adequate documentation makes it difficult to locate the source material.

This book fills a need in the chemical warfare field and should be useful to all non-medical gas officers (state gas con-

sultants and senior gas officers) concerned with civilian defense.

DAVID D. RUTSTEIN

**Housing for Health**—*Papers presented under the auspices of the Committee on the Hygiene of Housing of the American Public Health Association*, 1941. Available from A.P.H.A. Book Service. 221 pp. Price, paper, \$1.00.

The discussion of the criteria for the adequate housing of people has been the concern of investigators in this field for well over a century. During all this time the health aspects of the problem have taken a prominent position. The public health administrator, the physiologist, the social worker, the economist, and the lay citizens have all struggled with the problem in the hope of eventually developing standards of application which would be acceptable to the public at large and which would be within the realm of orthodox economic acceptance.

It has only been within recent years, however, that the public health profession has in an increasing degree made it its business to analyze the issues involved in a methodical and scientific manner, characteristic of its approach to other problems. When the Committee on the Hygiene of Housing of the American Public Health Association was created a few years ago, it set about the task of literally shedding light upon the details of housing necessity and housing requirements. Through these recent years a number of valuable studies and resulting papers have appeared under the general direction of the committee.

The volume now under review represents a collection of these documents published for the committee by the Milbank Memorial Fund as a further evidence of the Fund's continuing interest in the hygienic aspects of housing. The volume contains some 15 papers and reports, adding to the hitherto rela-

tively meager quantitative or engineering aspects of hygienic housing.

Important as this addition to knowledge is, the volume goes far beyond this contribution and provides an interpretation of the basic principles of hygienic housing. It relates its principles to municipal codes and their enforcement, to the technics of surveys and appraisals, and to the general problems of planning for recreation and decent family life.

One cannot read the volume without recognizing promptly that the issues involved in housing will far exceed the equipment, experience and perspective of the individual specialist in any field. The problem is one of joint integration of the technical and social activities of the physician, the engineer, the city planner, the law maker, the housing official, the mayor, and the interested lay citizen.

The collection of papers comes at an opportune time when the public health profession needs so much to be oriented with respect to modern housing. The volume, therefore, provides an excellent source for instruction, not only to the specialist in housing, but particularly to the practitioners in public health work to whom the public looks for guidance in matters related to housing.

It is interesting to point out, furthermore, Professor Winslow's comment in the volume that more damage is done to the health of the child of the United States by a sense of chronic inferiority due to the consciousness of life in sub-standard dwellings than by all the de-

fective plumbing which these dwellings may contain.

ABEL WOLMAN

**Anoxia: Its Effect on the Body—**  
*By Edward J. Van Liere. Chicago: University Press, 1942. 262 pp. Price, \$3.00.*

This timely volume attempts to summarize the available information on the effects of lack of oxygen on the body. Many of the tables and figures have appeared in other monographs. The various organ systems are treated in a systematic manner, but no mention is made of the effects of altitude on the reproductive function. Although certain studies concerning the anemic, stagnant, and histotoxic forms of anoxia are cited, most of the data deal with the effects of decreasing the oxygen tension in the inspired air. The general reader will welcome the sections on the definition of terms and the classification of anoxia. The author's distinction between asphyxia and anoxia is commendable. Many investigators will not accept the interpretation that the erythrocyte changes which occur when man is subjected to anoxia are the result of splenic contraction. The chapters on acclimatization and the effects of anoxia on the central nervous system are interesting. The chapter concerning the effects of anoxia on the alimentary tract reviews Dr. Van Liere's work on the relation of oxygen lack to the function of this system. The reviewer regrets that the titles of the individual references are not given.

WALTER S. ROOT

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**Two Hundred and Nine Needless Deaths**—There is a tendency for diphtheria to become relatively more prevalent among higher age groups as the protective program for infants and preschool children continues. This finding concludes the annual compilation of diphtheria deaths during a year with no extensive outbreaks, but in which the decline, though actual, was far less impressive than in preceding years.

ANON. Diphtheria Mortality in the Large Cities of the United States in 1941. *J.A.M.A.* 119, 18:1503 (Aug. 29), 1942.

**Typhoid Continues Its Decline**—New England, the Middle Atlantic, and North Central states have maintained their enviable record of low typhoid fever rates. Noteworthy too are the significant decreases in the cities of the South Central states, in this annual compilation of reported typhoid fever deaths.

ANON. Typhoid in the Large Cities of the United States in 1941. *J.A.M.A.* 119, 15:1188 (Aug. 8), 1942.

**When Old Folks Must Carry On**—Attempts to improve the health of the aged through education are especially timely, for as fewer physicians are left to care for the civil population, there will be less and less medical attention available for the aged ill. Longevity, unless accompanied by health and ability to work may become a social evil, philosophizes this writer. To which we say: Amen.

DUCKLES, D. Nutrition in Geriatrics. *J. Am. Dietet. A.* 18, 8:508 (Aug.), 1942.

**Facts vs. Enthusiasms**—There is no evidence that any vitamin or hormone has any direct relationship to arthritis. Where a specific deficiency coexists, vitamins or hormones may help the patient, but not cure the arthritis. Ordinarily, articles on medical treatment are excluded from this bibliography, but this paper seems to be of public health significance.

FREYBERG, R. H. Treatment of Arthritis with Vitamin and Endocrine Preparations. *J.A.M.A.* 119, 15:1164 (Aug. 8), 1942.

**Real Progress After a Hundred Years of Study**—Just where we stand in the matter of polio research, prevention, and care is told in the fewest possible words, and clearly too, in this paper read before the annual meeting of the Canadian Public Health Association.

GUDAKUNST, D. W. Poliomyelitis: Control and Treatment. *Canad. Pub. Health J.* 33, 8:365 (Aug.), 1942.

**Credits and Debits in National Nutrition**—Failure in peacetime to meet the needs that were then known to exist resulted in impaired man power for the defense of the country in time of war. If we are to profit by past failures, we can make the children of our war generation better able to put the world together again. How this can be done is the nub of this discussion.

HESELTINE, M. M. Nutrition—Today and Tomorrow. *Pub. Health Nurs.* 34, 8:428 (Aug.), 1942.

**More about Nutritional Shortcomings**—At one hospital, one-fourth

of all patients had been on a deficient diet, and of these 11.4 per cent showed definite signs of vitamin deficiency.

KRUPP, M. A. The Incidence of Nutritional and Vitamin Deficiency. *J.A.M.A.* 119, 18:1475 (Aug. 29), 1942.

**Mental Health in the Sticks—**Work of a mental hygiene unit, in the suburban sections of a county with exceptional social services, is described, and health departments in less favored counties are urged to go and do likewise.

LOTT, G. M. Mental Health Services in Rural Areas. *Pub. Health Rep.* 57, 31:1115 (July 31), 1942.

**Ability To Work—**Some illuminating statistics about the distribution of industrial and non-occupational illnesses, and time losses by sex and age groupings, are appended to this discussion of industrial health. It is pointed out that two-thirds of the lost time cases return to work on Monday. If recovered workers could be induced to return to the job as soon as they are able instead of waiting until the beginning of the succeeding week, a lot of lost time would be saved.

LYNCH, D. L. Industrial Health and the War. *New Eng. J. Med.* 227, 6:209 (Aug. 6), 1942.

**More about Polio—**Though you may be aware of the present status of poliomyelitis control, you may profit from reading this clear and brief summary of the state of our understanding.

MILZER, A., and LEVINSON, S. O. Recent Research in Infantile Paralysis. *Pub. Health Nurs.* 34, 3:434 (Aug.), 1942.

**Children in a "War of Nerves"—**Health workers interested directly, or remotely, with the welfare of children will welcome this symposium which is an outgrowth of a course given to teachers in New York City public schools. Psychology has become a deadly war

implement. Methods of arming children against it are discussed.

PEPPARD, S. H., *et al.* Mental Hygiene and Children in War Time. *Ment. Hyg.* 26, 3:353 (July), 1942.

**Sign of the Times—**Leading article in this month's official publication of the Associated Industries of Massachusetts is the story of the state's committee on industrial health (a part of the larger Public Safety Committee). The committee's job is to gather scientific information about workers' health and to make this information available to employers and employees. Eleven more articles on industrial health will follow in succeeding issues of the magazine.

PRENDERGAST, F. M. Our Second Front—Worker Health. *Industry.* 7, 11:7 (Aug.), 1942.

**Fitness To Fight—**Of the first 2,000,000 men examined for the Army draft, half were rejected by the examining boards. Selective Service was given the job of rehabilitating one-fifth of these rejectees. Then came Pearl Harbor, and minor defects were no longer disqualifying. Correctible defects are listed, and what has been done in some centers to correct them is related.

ROWNTREE, L. G. Rehabilitation and Pre-rehabilitation. *J.A.M.A.* 119, 15:1171 (Aug. 8), 1942.

**Spasm and Muscle Alienation—**Clearly described nursing details in the application of the Kenny method of care during the acute stages of poliomyelitis will prove illuminating to any health worker who wants to know what all the shooting is about in this revolutionary change in treatment.

STEVENSON, J. The Kenny Method. *Am. J. Nurs.* 42, 8:904 (Aug.), 1942.

**Syphilis in National Unfitness—**Of the first million draftees 45,000 had serologic evidence of syphilis. The



second million will probably repeat the record. (We don't know the rates as of 1917—tests in those days were too new and expensive, and not used in the draft examination.) Only about half the discovered cases are being brought under treatment. Tolerated prostitu-

tion and failure to apply epidemiologic methods are tragically evident deficiencies in our warfare against this disease.

VONDERLEHR, R. A. The Impact of the War on the Venereal-Disease Problem. *New Eng. J. Med.* 227, 6:203 (Aug. 6), 1942.

## BOOKS RECEIVED

MICROBIOLOGY AND MAN. By Jorgen Birke-land. New York: Crofts, 1942. 478 pp. Price, \$4.00.

PHYSIOLOGICAL HYGIENE. By Cleveland Pendleton Hickman. rev. ed. New York: Prentice-Hall, 1942. 482 pp. Price, \$3.25.

WAR MEDICINE. A Symposium. Winfield Scott Pugh, Editor. New York: Philosophical Library, 1942. 565 pp. Price, \$7.50.

THE FAMILY IN A WORLD AT WAR. Edited by Sidonie Matsner Gruenberg. New York: Harper, 1942. 298 pp. Price, \$2.50.

CIVILIAN HEALTH IN WARTIME. By Francis R. Dieuaide. Cambridge: Harvard University Press, 1942. 328 pp. Price, \$2.50.

EMERGENCY CARE. By Marie A. Wooders and Donald A. Curtis. Philadelphia: Davis, 1942. 560 pp. Price, \$3.50.

PSYCHOLOGY IN NURSING PRACTICE. By Philip L. Harriman, Lela J. Greenwood and Edward Skinner. New York: Macmillan, 1942. 483 pp. Price, \$3.25.

WHY WE HAVE AUTOMOBILE ACCIDENTS. By Harry R. De Silva. New York: Wiley, 1942. 394 pp. Price, \$4.00.

TERMINOLOGY AND DEFINITIONS OF SPEECH DEFECTS. By Mardel Ogilvie. New York: Bureau of Publications, Teachers College, 1942. 312 pp. Price, \$3.50.

CHEMISTRY OF INSECTICIDES AND FUNGICIDES. By Donald E. H. Frear. New York: Van Nostrand, 1942. 300 pp. Price, \$4.00.

BONNIE'S BABY BROTHER AND HOW HE GREW. By Elizabeth Rider Montgomery. New York: Stokes, 1942. 95 pp. Price, \$2.00.

MICROBIOLOGY OF MEATS. By L. B. Jensen. Champaign: Garrard Press, 1942. 252 pp. Price, \$4.00.

THE PHARMACOPOEIA OF THE UNITED STATES OF AMERICA. Twelfth Revision. Easton: Mack Printing Co., 1942. 880 pp. Price, \$7.50.

HOSPITAL DISCHARGE STUDY. By Neva R. Deardorff and Marta Fraenkel. Vol. I. New York: Welfare Council of New York City, 1942. 209 pp. Price, \$1.00.

THE MEAT YOU EAT. Report of the New York State Trichinosis Commission, Legislative Document No. 35, 1942. Newburgh: New York State Trichinosis Commission, 1942. 141 pp.

CLINICAL THERMOMETERS. 3rd ed. Commercial Standard Cs1-42. Washington: Government Printing Office, 1942. Price, \$1.00.

LEAGUE OF NATIONS. Report of the League 1941-1942 submitted by the Acting Secretary-General. 94 pp. Geneva: Publications Department of the League of Nations, 1942.

THE MENTALLY ILL AND PUBLIC PROVISION FOR THEIR CARE IN ILLINOIS. By Stuart K. Jaffary. Chicago: University of Chicago Press, 1942. 214 pp. Price, \$1.25.

YOUTH LOOKS AT SCIENCE AND WAR. New York: Penguin Books, 1942. 133 pp. Price, \$2.25.

FIRST AID. POPULAR. By Fritz Kahn. New York: Krause, 1942. 56 pp. Price, \$60.

FIRST AID. SURGICAL AND MEDICAL. By Warren H. Cole, Charles B. Puestow and 17 Other Medical Authorities. New York: Appleton-Century, 1942. 374 pp. Price, \$3.00.

A HANDBOOK OF ALLERGY FOR STUDENTS AND PRACTITIONERS. By Wyndham B. Blanton. Springfield: Thomas, 1942. 190 pp. Price, \$3.00.

# ASSOCIATION NEWS

## SEVENTY-FIRST ANNUAL MEETING

ST. LOUIS, MO., OCTOBER 27-30, 1942

*Meeting Headquarters: Auditorium*

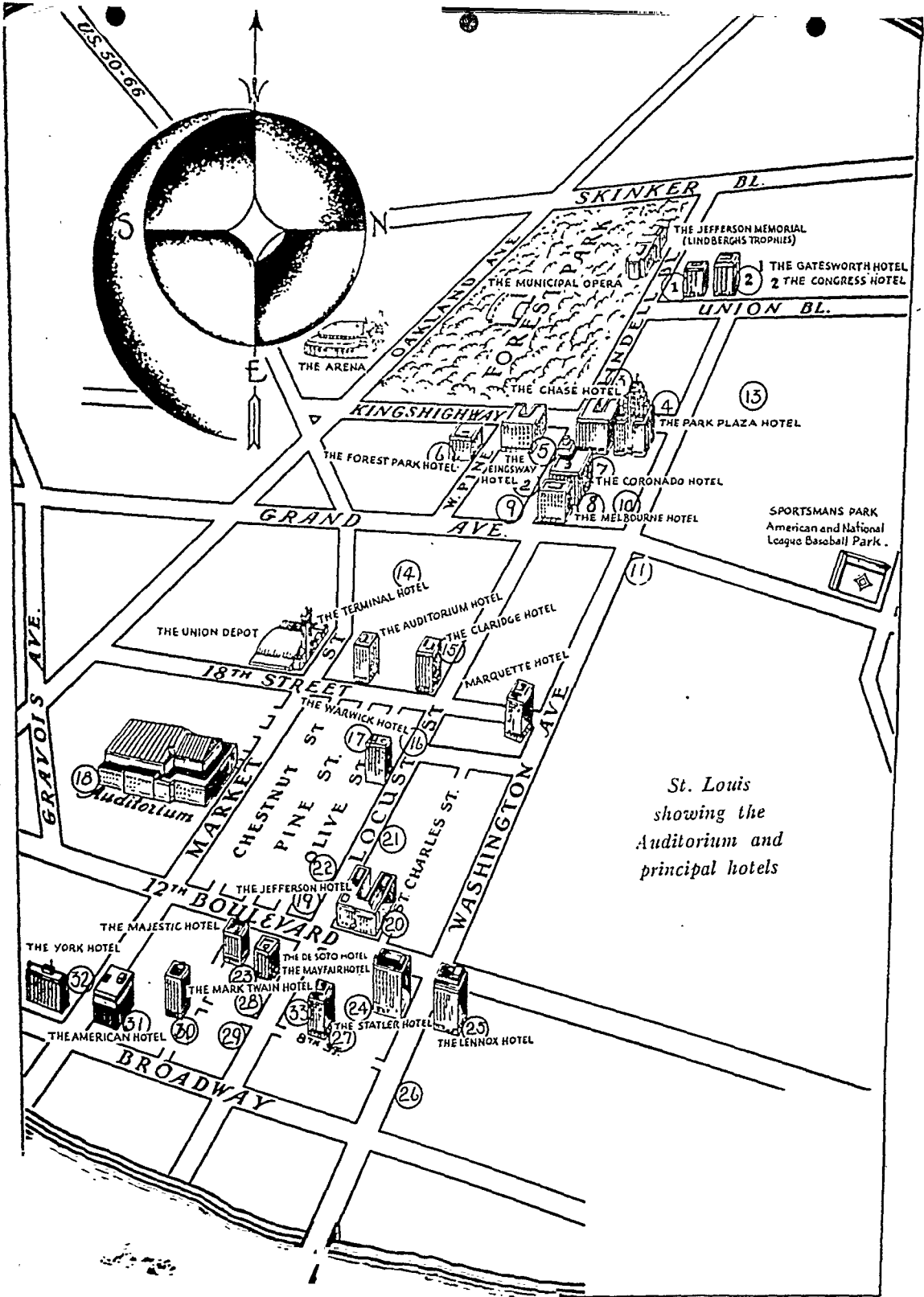
*Residence Headquarters: Hotels Jefferson and Statler*

### RAILROAD FARES FROM VARIOUS POINTS TO ST. LOUIS, MO.

*American Public Health Association*

*October 27-30, 1942*

<i>From</i>	<i>One-way for Pullman Travel</i>	<i>Round-trip for Pullman Travel</i>	<i>One-way Lower Berth</i>	<i>One-way Upper Berth</i>
Atlanta, Ga.	\$20.80	\$31.20	\$5.25	4.00
Baltimore, Md.	29.65	53.55	6.95	4.80
Boston, Mass.	40.10	72.20	9.25	6.40
Buffalo, N. Y.	23.70	43.80	5.80	4.40
Chicago, Ill.	9.65	14.45	2.95	2.20
Cleveland, Ohio	17.60	33.20	4.35	3.30
Dallas, Tex.	22.00	33.05	6.40	4.90
Denver, Colo.	30.05	45.10	7.90	5.95
Duluth, Minn.	23.95	35.95	6.40	4.90
Fort Worth, Tex.	22.45	33.65	6.40	4.90
Indianapolis, Ind.	8.20	16.05	2.95	2.00
Jacksonville, Fla.	31.10	46.65	8.10	6.20
Kansas City, Mo.	9.20	13.80	2.95	2.20
Louisville, Ky.	9.40	14.10	2.95	2.00
Los Angeles, Calif.	67.10	94.15	17.35	13.20
Memphis, Tenn.	10.25	15.40	2.95	2.20
Milwaukee, Wis.	12.45	18.65	3.50	2.65
Minneapolis, Minn.	19.30	28.95	4.35	3.30
Nashville, Tenn.	11.20	16.80	2.95	2.20
New Orleans, La.	25.60	38.45	6.80	5.15
New York, N. Y.	34.85	62.80	8.45	5.80
Omaha, Nebr.	13.85	20.80	3.50	2.65
Philadelphia, Pa.	31.90	57.40	7.85	5.40
Pittsburgh, Pa.	20.40	38.10	4.95	3.45
Portland, Ore.	72.10	94.15	17.35	13.20
Salt Lake City, Utah	46.30	64.70	11.90	9.05
San Francisco, Calif.	67.10	94.15	17.35	13.20
Seattle, Wash.	72.95	94.15	17.35	13.20
Washington, D. C.	29.65	53.55	6.95	4.80
Montreal, Que.	37.55	67.05	9.25	6.40
Halifax, N. S.	65.20	91.60	17.35	13.20
Ottawa, Ont.	34.25	61.60	8.45	5.80
Quebec, P. Q.	43.80	78.20	9.25	6.40
Toronto, Ont.	24.90	44.30	5.80	4.40
Vancouver, B. C.	72.95	94.15	17.35	13.20



St. Louis  
showing the  
Auditorium and  
principal hotels

American Hotel .....	31	Gatesworth Hotel .....	1	St. Louis University .....	9
Bishop Tuttle Memorial .....	19	Jefferson Hotel .....	20	Scruggs-Vandervoort-Barney .....	28
Board of Education .....	53	Kingsway Hotel .....	5	Sheldon Memorial .....	10
Chase Hotel .....	3	Lennox Hotel .....	25	Statler Hotel .....	24
Claridge Hotel .....	15	Mark Twain Hotel .....	30	Stix, Baer & Fuller .....	26
Congress Hotel .....	2	Mayfair Hotel .....	27	Third Baptist Church .....	11
Coronado Hotel .....	7	Melbourne Hotel .....	8	Vashon High School (Negro) ..	14
DeSoto Hotel .....	23	Municipal Auditorium .....	18	Warwick Hotel .....	17
Elks Club .....	12	Park Plaza Hotel .....	4	Y.M.C.A. ....	16
Famous-Barr .....	39	Public Library .....	22	York Hotel .....	32
Forest Park Hotel .....	6	Roosevelt Hotel .....	13	Y.W.C.A. ....	21

## RATES QUOTED BY ST. LOUIS HOTELS

*Seventy-First Annual Meeting, October 27 to 30, 1942*

## AMERICAN PUBLIC HEALTH ASSOCIATION

ALL RATES QUOTED ARE FOR ROOMS WITH BATH  
ON EUROPEAN PLAN

<i>Hotel</i>	<i>Single</i>	<i>Double</i>	<i>Suites</i>
New Hotel Jefferson	\$3.00-5.00-6.00-7.00	\$6.00-7.00-7.50-8.00	\$12.00-20.00
Statler	3.00-3.50-3.75-4.00 4.25-4.75-5.00	5.25-6.00-6.25-6.50 6.75-7.00-9.00	17.00-18.00
American	2.00-2.50	3.50-4.00	
Claridge	2.50-3.00	3.50-7.00	
Coronado	2.25 (shower) 2.75	4.50-5.00	6.00
DeSoto	2.65-up	4.00-5.00	8.00
Lennox	3.50-4.00-4.50-5.00 6.00	4.50-5.00-6.00-7.00 8.00	10.50-14.50
Mark Twain	2.50-4.00	3.50-5.00-5.50	
Maryland	2.25-2.50-2.75	3.25-3.50-3.75-4.00 4.50	
(without bath)	1.75-2.00	2.75-3.00	
Mayfair	3.00-3.50-4.00-5.00	4.00-4.50-5.50-6.00 7.00	
Melbourne	2.65-3.20-3.70-4.20	4.20-4.80-5.30-5.80 6.20	
Park Plaza	4.50	6.00-8.00	12.00-18.00
Warwick	2.00-2.50-3.00	3.00-3.50-4.00-4.50 5.00	7.00-10.00

.....(Cut off on this line and mail to the hotel of your choice).....

HOTEL RESERVATION BLANK FOR THE ST. LOUIS MEETING  
AMERICAN PUBLIC HEALTH ASSOCIATION, OCTOBER 27-30, 1942To .....  
(Name of Hotel)Please reserve for me ..... rooms for ..... persons  
for the A.P.H.A. Meeting.

Single room ..... Double room .....

Maximum rate per day for room \$. ..... Minimum rate per day for room \$. .....

I expect to arrive ..... If date of arrival is changed I will notify  
you at least 24 hours in advance.

Please acknowledge this reservation.

Name .....

Street Address.....

City..... State.....

## ANNUAL MEETING INFORMATION IN REVIEW

**TIME AND PLACE:** 71st Annual Meeting, October 27-30, St. Louis, Mo. Meetings of related organizations, Saturday, October 24, Sunday, October 25, and Monday, October 26.

**HOTELS:** The New Jefferson and the Statler are the headquarters hotels. Their rates, and rates of other St. Louis hotels are given on page 1184.

**MEETING:** The Auditorium is meeting headquarters.

**EXHIBITS:** Auditorium.

**REGISTRATION:** Auditorium. Registration opens Sunday, October 25, at 8:30 A.M.

**ADVANCE REGISTRATION:**

Required for the Conference on Orthopedic Nursing, sponsored by the Joint Orthopedic Nursing Advisory Service, on Sunday, October 25, and Monday, October 26.

Required for the Eye Health Institute, sponsored by the National Society for the Prevention of Blindness, Inc., on Sunday, October 25, and Monday, October 26.

Urged for the Ninth Institute on Public Health Education, Sunday, October 25, Monday, October 26, and Tuesday, October 27.

**PRELIMINARY PROGRAM:** Published in the August *Journal*, pages 890-920. Supplementary information, September, pages 1066-1067.

**FINAL PROGRAM:** Available at the Registration Desk, Auditorium, from Sunday morning, October 25.

**LOCAL COMMITTEE CHAIRMAN:** Joseph F. Bredeck, M.D., Commissioner of Health, St. Louis, Mo.

## THE HEALTH EXHIBIT

THE Health Exhibit held in connection with Annual Meetings of the Association conveys as much information, in the opinion of many delegates, as does the scientific program. At St. Louis, nearly 200 booths will be occupied by technical and scientific exhibitors. In most instances, the materials and equipment to be exhibited play some part in solving the problems of the emergency. A list of the technical exhibitors is published on page XXX of this issue. A complete description of each exhibit was published in the August *Journal*.

The Committee on Scientific Exhibits takes pleasure in announcing that space has been allocated thus far to the following organizations on behalf of exhibits on the subjects indicated:

Agricultural Marketing Administration  
The School Lunch Program  
American Bureau for Medical Aid to China, Inc.  
China's Health in War  
American Dental Association  
Preventive Dentistry  
American Medical Association  
Health Education in the Doctor's Office  
Dietary Deficiency Diseases

An Industrial Health Program for a County Medical Society  
American School Health Association  
Information Booth  
American Social Hygiene Association  
The Minor Genito-Infectious Diseases  
American Society for the Control of Cancer, Inc.  
The Value of Mice in Cancer Research  
American Society for the Hard of Hearing  
Prevention of Deafness and Conservation of Hearing  
British Information Services  
Britain's Wartime Nutrition  
Children's Bureau, U. S. Department of Labor  
Maternal and Neonatal Deaths, 1930-1940  
Cincinnati Municipal Health Center  
Planning a Health Center  
Cleveland Health Museum  
Exhibits on a Budget  
Committee on the Hygiene of Housing, American Public Health Association  
Housing Survey Procedures  
Committee on Local Health Units, American Public Health Association  
Department of Medical Genetics, Bowman Gray School of Medicine  
Prevention of the Hereditary Diseases Which Wreck Childhood  
East Side Health District, East St. Louis, Illinois  
Activities of the East Side Health District  
Farm Security Administration  
Health Is Vital to War Food Production  
Health Department of the City of St. Louis

Activities of the Health Department  
 Hospital Division of the City of St. Louis  
 Activities of the Hospital Division  
 Iowa State Department of Health  
 Brucellosis  
 Medical Division, Office of Civilian Defense  
 Medical Aspects of Chemical Warfare in  
 Civilian Protection  
 Emergency Medical Service for Civilian  
 Defense  
 Metropolitan Life Insurance Company  
 Health Progress and American Man Power  
 National Leprosarium  
 Leprosy. Clinical Types and Roentgeno-  
 grams  
 National Organization for Public Health  
 Nursing  
 Information Booth  
 National Society for the Prevention of Blind-  
 ness  
 Some Wartime Eye Problems  
 New York State Health Department  
 Home and Farm Safety

St. Louis Society for Crippled Children  
 Facilities for Crippled Children in the St.  
 Louis Area  
 St. Louis University School of Dentistry  
 Pathology of Diseases of Jaws and Teeth  
 with Reference to Public Health Problems  
 St. Louis University School of Nursing  
 Venereal Disease and Industrial Nursing  
 Shriners' Hospitals for Crippled Children, St.  
 Louis Unit  
 Treatment and Apparatus Used for Crippled  
 Children  
 Squibb Institute for Medical Research  
 Lymphogranuloma Venereum  
 Subcommittee on Nursing, Office of Defense  
 Health and Welfare Services  
 America at War Needs Nurses  
 U. S. Public Health Service  
 Two Million Selectees Blood Tested for  
 Syphilis  
 Care vs. Caries, from Boyhood to Soldier  
 Aircraft Quarantine  
 35 mm. Photofluorographic X-ray Units

### HEALTH EDUCATION CENTER

ACCORDING to the Social Work Publicity Council, material is coming from all over the country for the display of health education specimens to be shown during the Health Education Institute and the Annual Meeting in St. Louis. The collection will be housed in the Health Education Center in the Auditorium, which the Publicity Council is conducting again this year for the Association. Portfolios, annual reports, booklets, bulletins, pictorial statistics, radio scripts, newspaper publicity, posters, and other public education media will be available for study. All the portfolios are being planned to bring the most useful ideas and information to health educators in the war period.

A special feature of the Health Education Center will be a consultation service open to those enrolled in the Health Education Institute. Monday morning, when there are only two scheduled round tables on the Institute program, has been designated as "consultation period." There will be

limited opportunity for delegates who do not attend the Institute to make appointments with the consultants at the Center at other times during the week.

The preliminary roster of consultants on your health education problems includes: Mary P. Connolly, Department of Health, Detroit; Mayhew Derryberry, Ph.D., National Institute of Health, Bethesda, Md.; Bruno Gebhard, M.D., Cleveland Health Museum; Ruth E. Grout, Ph.D., U. S. Office of Education, Washington, D. C.; Ira V. Hiscock, Sc.D., Yale University School of Medicine, New Haven; Marion McKinney, Department of Health, Health Education Service, White Plains, N. Y.; Lucy Morgan, Ph.D., Craven County Health Department, New Bern, N. C.; Delbert Obertueffer, Ph.D., Professor of Physical Education, Ohio State University; Edward A. Pool, Zurich Insurance Company, Chicago; C. E. Turner, Dr.P.H., Massachusetts Institute of Technology, Department of Public Health.

## JOURNAL EXPANDS EDITORIAL STAFF

THE Editorial Board of the *American Journal of Public Health*, with the approval of the Executive Board of the Association, has announced the appointment, effective September 1, of two additional Associate Editors, namely, Martin Frobisher, Jr., Sc.D., of the Johns Hopkins School of Hygiene and Public Health, Baltimore, Editor of the *American Journal of Hygiene*; and James E. Perkins, M.D., Dr.P.H., As-

sistant Commissioner, New York State Department of Health, Albany. Leona Baumgartner, M.D., Ph.D., Director of the Division of Child Hygiene, New York City Department of Health, and Arthur P. Miller, C.E., U. S. Public Health Service, New York City, will continue to serve as Associate Editors.

The Editorial Board has announced that the circulation has reached an all-time high of 9,400 copies for the *Journal*.

## APPLICANTS FOR FELLOWSHIP

*In accordance with the By-laws of the Association, the names of applicants for Fellowship are officially published herewith. They have requested affiliation with the Sections indicated. Action by the various Section Councils, the Committee on Eligibility, and the Governing Council will take place at the St. Louis Annual Meeting.*

## Health Officers Section

Charles G. Baker, M.D., Assistant Health Officer and Venereal Disease Control Officer, Fayette County Health Dept., Lexington, Ky.  
 Arthur L. Barbakoff, M.D., M.S.P.H., Director, Lee County Defense Health Unit, Freeport, Ill.  
 Dwight M. Bissell, M.D., M.S.P.H., Health Officer, San Jose, Calif.  
 Monroe F. Brown, M.D., M.P.H., Director of Local Health Service, State Department of Health, Nashville, Tenn.  
 W. D. Burkhalter, M.D., M.P.H., Assistant Health Officer, Memphis and Shelby County Health Departments, Memphis, Tenn.  
 Jose Chaves, M.D., Director, Public Health Units, Puerto Rico Health Department, Santurce, P. R.  
 Robert C. Farrier, M.D., Director, East Side Health District, East St. Louis, Ill.  
 Lawrence W. Fitzmaurice, M.D., D.P.H., Chairman, Board of Health, Nassau, Bahamas, B.W.I.  
 Edward J. Godfrey, M.D., Health Officer, Waterbury, Conn.  
 James T. Googe, M.D., C.P.H., Senior Medical Officer, Farm Security Administration, Denver, Colo.  
 Donald M. Harris, M.D., M.S.P.H., District Medical Director, State Health Department, Spencer, Iowa  
 John M. Hooper, M.D., M.P.H., Venereal Disease Control Officer, U. S. Army Medical Corps, McKinney, Tex.  
 Hugo V. Hullerman, M.D., M.S.P.H., Deputy

Commissioner of Health, Peoria, Ill.  
 Rutherford O. Ingham, M.D., M.P.H., Health Officer, Washington County Health Department, Jonesboro, Ala.  
 Lorin E. Kerr, Jr., M.D., M.S.P.H., Health Commissioner, Lorain County Health Department, Oberlin, Ohio  
 Leon R. Kramer, D.D.S., M.S.P.H., Director, Division of Dental Hygiene, State Board of Health, Topeka, Kans.  
 Charles J. Larkey, M.D., Health Officer, Bayonne, N. J.  
 Ezequiel Martinez-Rivera, M.D., M.Sc.P.H., Assistant Director, Bureau of Health Units, Department of Health, Hato Rey, P. R.  
 Sumner M. Miller, M.D., Commissioner of Health, Peoria, Ill.  
 George F. Moench, M.D., M.Sc.P.H., County Health Director, Calhoun County Health Department (W. K. Kellogg Foundation), Marshall, Mich.  
 John C. Neale, Jr., M.D., C.P.H., Assistant Director, Rural Health, State Department of Health, Norfolk, Va.  
 Jerome S. Peterson, M.D., M.P.H., District Health Officer, Department of Health, New York, N. Y.  
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 Erwin C. Sage, M.D., M.P.H., Director, Des Moines County Health Service, Burlington, Iowa  
 James P. Sharon, M.D., M.P.H., Director of Venereal Diseases, State Department of Health, Lincoln, Nebr.

Jerome J. Sievers, M.D., M.S.P.H., District Health Superintendent, State Department of Public Health, Springfield, Ill.

Courtney Smith, M.D., Dr.P.H., Assistant Commissioner of Health, Territory of Alaska, Juneau, Alaska

Charles A. Steurer, M.D., Director, Division of Communicable Diseases, Nassau County Department of Health, Mineola, L. I., N. Y.

Harry Wain, M.D., M.S.P.H., Health Commissioner, Sidney and Shelby County, Sidney, Ohio

James P. Ward, M.D., M.P.H., Director, Washington County Health Department, Greenville, Miss.

#### *Laboratory Section*

L. A. Barnes, Ph.D., Lieutenant, Epidemiology and Sanitation, U. S. Navy Medical School, Bethesda, Md.

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Walter J. Beichert, M.D., Bacteriologist and Chemist, Lindsay Laboratories, Brooklyn, N. Y.

George D. Brigham, Ph.D., Officer in Charge, Typhus Research Laboratory, U. S. Public Health Service, Savannah, Ga.

Claude P. Brown, M.D., Assistant Director, State Department of Health Laboratories, Philadelphia, Pa.

Elizabeth C. Brown, M.S., Serologist, State Department of Health, St. Louis, Mo. (On leave of absence)

William D. Dotterrer, B.S., Director of Laboratories, Bowman Dairy Company, Chicago, Ill.

Lloyd D. Felton, M.D., D.Sc., Senior Surgeon, U. S. Public Health Service, Washington, D. C.

Earl W. Flosdorf, Ph.D., Assistant Professor of Bacteriology, University of Pennsylvania, Philadelphia, Pa.

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Elizabeth F. Genung, M.S.A., Associate Professor of Bacteriology, Smith College, Northampton, Mass.

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Margaret R. Harrison, M.A., Chemist, U. S. Public Health Service, U. S. Marine Hospital, Staten Island, N. Y.

J. V. Irons, Sc.D., Associate Director of Laboratories, State Department of Health, Austin, Tex.

Gerard Laviano, M.D., Owner and Director, Woodside Medical Laboratory, Woodside, L. I., N. Y.

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Louis W. Sauer, M.D., Ph.D., Assistant Professor of Pediatrics, Northwestern University Medical School, Evanston, Ill.

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#### *Vital Statistics Section*

Billy Tober, State Registrar of Vital Statistics and Supervisor of Finance, State Department of Health, Santa Fe, N. M.

#### *Engineering Section*

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Paul F. Krueger, B.S., Chief Sanitary Officer, Department of Health, Chicago, Ill.

George O. Pierce, M.S., C.P.H., Assistant Professor, Department of Preventive Medicine and Public Health, University of Minnesota, Minneapolis, Minn.

Blucher A. Poole, B.S.C.E., Chief Engineer, State Board of Health, Indianapolis, Ind.

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*Industrial Hygiene Section*

- James M. Carlisle, M.D., Medical Director, Merck & Co., Inc., Westfield, N. J.  
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 Edward C. Holmblad, M.D., Consulting Industrial Surgeon, and Local Medical Officer, Eastman Kodak Co., Chicago, Ill.  
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 Carl M. Peterson, M.D., Secretary, Council on Industrial Health, American Medical Association, Chicago, Ill.  
 Harold W. Slocum, A.B., Executive Secretary, Vermont Tuberculosis Association and Director, Tuberculosis Division, State Department of Health, Burlington, Vt.  
 Marion F. Trice, B.S., Industrial Hygiene Engineer, State Board of Health, Raleigh, N. C.  
 William N. Witheridge, M.S., Chief, Bureau of Industrial Hygiene, Health Department, Detroit, Mich.

*Food and Nutrition Section*

- H. D. Kruse, M.D., Sc.D., Staff Member, Milbank Memorial Fund, New York, N. Y.  
 Alice H. Smith, M.S., Nutritionist, Cleveland Health Council, Cleveland, Ohio

*Maternal and Child Health Section*

- Florence A. Browne, M.D., M.S.P.H., Director, Bureau of Maternal and Child Health, Board of Health, Hartford, Conn.  
 Marcia Hays, M.D., Dr.P.H., Associate in Maternal and Child Health, U. S. Children's Bureau, San Francisco, Calif.  
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*Public Health Education Section*

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*Public Health Nursing Section*

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*Epidemiology Section*

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- Ross L. Gauld, M.B., Dr.P.H., Associate in Epidemiology, Johns Hopkins School of Hygiene and Public Health, Baltimore, Md.
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- Herman E. Hilleboe, M.D., M.P.H., P. A. Surgeon-in-Charge Tuberculosis Control, U. S. Public Health Service, Washington, D. C.
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- Alvin E. Keller, M.D., Associate Professor, Department of Preventive Medicine and Public Health, Vanderbilt University, Nashville, Tenn.
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- James H. Lade, M.D., Assistant Director, Division of Syphilis Control, State Department of Health, Albany, N. Y.
- Frederick R. Lang, M.D., Dr.P.H., In Charge, Section of Epidemiology, and Assistant to Officer in Charge, Division of Preventive Medicine, Bureau of Medicine and Surgery, Navy Department, Washington, D. C.
- George M. Leiby, M.D., Dr.P.H., Chief, Division of Preventive Medicine, State Board of Health, New Orleans, La.
- Morton L. Levin, M.D., Dr.P.H., Assistant Director, Division of Cancer Control, State Department of Health, Albany, N. Y.
- Atilio Macchiavello, M.D., Dr.P.H., Director, Ecuadorian Public Health Service, Guayaquil, Ecuador
- Basil C. MacLean, M.D., M.P.H., Director, Strong Memorial Hospital, University of Rochester, Rochester, N. Y.
- J. A. Myers, M.D., Ph.D., Professor of Public Health and Preventive Medicine, University of Minnesota School of Medicine, Minneapolis, Minn.
- Arthur W. Newitt, M.D., M.P.H., Director, Bureau of Local Health Service, State Board of Health, Jacksonville, Fla.
- John J. Phair, M.D., Dr.P.H., Associate in Epidemiology, Johns Hopkins School of Hygiene and Public Health, Baltimore, Md.
- David D. Rutstein, M.D., Consultant in the Medical Aspects of Chemical Warfare, U. S. Public Health Service, Washington, D. C.
- Irvin W. Sander, M.D., Dr.P.H., Professor of Preventive Medicine and Public Health and Director, Student Health Service, Wayne University, Detroit, Mich.
- Philip E. Sartwell, M.D., M.P.H., Assistant Director, Division of Tuberculosis, State Department of Health, Boston, Mass.
- James J. Siragusa, M.D., M.P.H., Health Officer in charge of Health Unit, Health Department, Boston, Mass.
- Stafford M. Wheeler, M.D., Lieutenant, Junior Grade, U. S. Navy Medical Corps, Bethesda, Md.

#### Unaffiliated

- Joseph M. Curry, V.S., B.V.Sc. (Lieutenant Colonel, U. S. Army), Station Veterinarian, Keesler Field, Miss.
- Rolla E. Dyer, M.D., Director, National Institute of Health, Bethesda, Md.
- Anthony G. Featherston, M.D., M.S.P.H., Administrator, Philadelphia Health Center, Philadelphia, Pa.
- Carlos E. Finlay, M.D., formerly Director of Public Health, Havana, Cuba
- John G. Grant, M.D., Head, Department of Hygiene and Director, Student Health Service, Iowa State College, Ames, Iowa
- G. Hill Hodel, M.D., Chief, Division of Social Hygiene, Los Angeles County Health Department, Los Angeles, Calif.
- Anthony J. Lamberti, M.S., Instructor in Bacteriology, Villanova College, Philadelphia, Pa.
- Charles H. Mann, Jr., M.D., Dr.P.H., Member, Medical Department, E. R. Squibb & Sons, New York, N. Y.
- Lester M. Petrie, M.D., M.P.H., Director,

Industrial Hygiene Service, State Department of Health, Atlanta, Ga.  
 Hildrus A. Poindexter, M.D., M.S.P.H., Professor and Head, Department of Bacteriology, Preventive Medicine and Public

Health, Howard University, Washington, D. C.  
 Marion Yang, M.D., Senior Technical Expert, National Institute of Health, Chungking, China

## APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

### *Health Officers Section*

Lawrence Arnstein, B.S., 45 2nd St., San Francisco, Calif., Executive Secretary, California Social Hygiene Assn.  
 Maurice J. Ayres, M.D., County Health Officer, Tuscumbia, Mo., Miller County and State Health Dept.  
 Lawrence W. Kaufman, M.D., 4518 S. Howell Ave., Milwaukee, Wis., Health Officer, Town of Lake Health Dept.  
 Harvey A. Kelly, M.D., 200 Pleasant St., Winthrop, Mass., Member Advisory Committee, State Dept. of Public Health  
 Harry Lowens, M.D., Muskogee City-County Health Unit, Muskogee, Okla., Assistant Director  
 Frederick D. Mott, M.D., C.M., 5506 Wriley Rd., Washington, D. C., Chief Medical Officer, Farm Security Administration  
 J. M. Pickard, M.D., County Health Office, Court House, Dallas, Tex., Health Officer  
 Samuel S. Reinglass, M.D., M.P.H., 422 Second Ave., Dixon, Ill., Dist. Health Supt., State Dept. of Public Health  
 Frank W. Stewart, M.D., 209 City Hall, Long Beach, Calif., Asst. City Health Officer

### *Laboratory Section*

Marjorie A. Bloom, B.A., Public Health Laboratory, Fargo, N. D., Bacteriologist  
 Louis R. Curtis, Ph.D., 2184 Oneida St., Salt Lake City, Utah, Chief Sanitarian, City Board of Health  
 Lieut. Wilbur E. Deacon, Army and Navy General Hospital, Hot Springs, Ark., Sanitary and Medical Bacteriologist  
 Harold Friedlander, M.A., 2105 N. 18th St., Arlington, Va., Asst. Bacteriologist, U. S. Dept. of Agriculture  
 William G. Garner, M.D., 329 Eccles Bldg., Ogden, Utah, City Bacteriologist and Technologist, City Health Dept.  
 Isaac F. Gratch, M.D., 1217 S. Broad St., Philadelphia, Pa., Associate in Preventive Medicine & Public Health at Hahnemann Medical College and Hospital  
 Aurelio A. Lopez, B.S., M.T., Hospital Amador

Guerrero, Colon, Panama, Director de Laboratorio  
 Albert Milzer, Ph.D., 2912 Ellis St., Chicago, Ill., Research Bacteriologist, Deutsch Serum Center, Michael Reese Hospital  
 Leo Moschkowitz, M.D., 134½ N. 10th St., Olean, N. Y., Pathologist and Director of Laboratories, Olean General Hospital  
 Ruth P. Parker, A.B., 354 Spruce St., San Francisco, Calif., Laboratory Technician, Childrens Hospital  
 Lloyd C. Shields, 1033 Gayley Ave., Los Angeles, Calif., Medical Laboratory Technician, Westwood Medical Laboratory  
 Janey G. Stanfield, Dept. of Health, Otisville, N. Y., Laboratory Asst., New York City Dept. of Health  
 Clara Will, M.S., State Laboratory of Hygiene, Raleigh, N. C., Bacteriologist

### *Vital Statistics Section*

Lillian V. Lawhorn, B.A., 619 W. Clinch St., Knoxville, Tenn., Senior Statistical Clerk, Knoxville Health Dept.  
 Francis D. Rhoads, A.M., State Dept. of Health, Charleston, W. Va., Director, Div. of Vital Statistics  
 Mabel Tramp, B.S., 414 7th St., Bismarck, N. D., Statistician, State Dept. of Health

### *Engineering Section*

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 Earl C. Huston, Cherokee County Health Unit, Columbus, Kan., Sanitarian  
 Lieut. Whitney E. Lawrence, Camp Dispensary, Camp Beauregard, La., Sanitary Corps, U. S. Army  
 George Loelkes, Rt. 5, Box 235, Springfield, Mo., Sanitary Engineer, City of Springfield  
 Samuel L. Resnick, B.S., County Health Dept., Camden, S. C., Junior Public Health Engineer, U. S. Public Health Service  
 Francis S. Weir, B.S., 1604 Smith Young Tower, San Antonio, Tex., Junior Public Health Engineer, U. S. Public Health Service

*Industrial Hygiene Section*

Harold T. Castberg, M.D., 2002 Acton St., Berkeley, Calif., Acting Chief, California Industrial Hygiene Service

*Food and Nutrition Section*

Edward Becker, 430 N. 16th St., Kansas City, Kan., Commissioner of Finance, Health and Public Property, Dept. of Health

Joseph Mahoney, 320 N. 13th St., Kansas City, Kan., Dairy Inspector, Dept. of Health

Jean P. Morris, M.A., 2101 Adelbert Rd., Cleveland, Ohio, Asst. Nutritionist, Cleveland Health Council

William A. Queen, B.A., 922 S. Washington St., Alexandria, Va., Chief, Div. of State Cooperation, Food and Drug Admin., Federal Security Agency

James F. Rinehart, M.D., Univ. of California Medical School, San Francisco, Calif., Board Member, State Dept. of Public Health

*Maternal and Child Health Section*

Nolan A. Owens, M.D., 1001 Irving St., N.W., Washington, D. C., Associate in Pediatrics, Health Dept.

Marguerite B. Richards, M.D., 1830 Flower St., Bakersfield, Calif., Asst. Director of Maternal and Child Health, Kern County Dept. of Health

*Public Health Education Section*

Gerald D. Fry, B.A., 411 N. 10th St., St. Louis, Mo., Director of Health Education, Mo. Tuberculosis Assn.

Katherine Hope, M.A., 5510 Cates Ave., St. Louis, Mo., Medical Social Worker, St. Louis Training School

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*Public Health Nursing Section*

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Leah M. Barskey, R.N., Box 191, Dixon, Ill., Public Health Nurse, State Dept. of Health

Mildred M. Eslick, B.S., 1307 Pere Marquette Bldg., New Orleans, La., Asst. Public Health Nursing Consultant, U. S. Public Health Service

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Minnie McEvoy, City Hall, 6th & Ann., Kansas City, Kan., Supervisor of Nurses, Health Dept.

Celia Moore, R.N., B.S., City-County Health Unit, Muskogee, Okla., Asst. Public Health Nursing Consultant

Mary E. Parker, R.N., M.S., State Dept. of Health, Cardiac Bureau, Albany, N. Y., Consultant Public Health Nurse

Henrietta Perlman, R.N., Isolation Hospital, Unit 21, Peru, Ill., Dist. Public Health Nurse, State Dept. of Public Health

Margaret E. Prunty, C.P.H., Gilmer County Health Dept., Glenville, W. Va., Public Health Nurse

*Epidemiology Section*

Beverly A. Benson, M.S.P.H., 2109 Peachtree Rd., Atlanta, Ga., Junior Laboratory Helper, Fourth Corps Area Laboratory

Dr. Samuel H. Castro, Fundidora de Monterrey No. 108-Col Industrial, Mexico, D. F.

Elvira M. DeLee, M.D., M.P.H., New York Univ., Medical College, 477 First Ave., New York, N. Y., Instructor, Dept. of Preventive Medicine

Sylvia S. Haven, A.B., 1235 Kapiolani Blvd., Honolulu, Hawaii, Bacteriologist and Executive Secretary, Medical Milk Commission

Paul E. Lyday, B.S., 8 Dale St., Asheville, N. C., Epidemiologist, Asheville City and Buncombe County Health Dept.

Gustavo G. Molina, M.D., M.P.H., Casilla 48, Santiago, Chile, S. A., Epidemiologist, Direccion General de Sanidad

Norman B. Nelson, M.D., Dr.P.H., 1726 N. Fuller St., Hollywood, Calif., Epidemiologist, Los Angeles City Health Dept.

Harold E. Pearson, M.D., M.P.H., School of Public Health, Univ. of Michigan, Ann Arbor Mich., Asst. Professor of Epidemiology

*Unaffiliated*

Harry J. Becker, M.A., 4932 Cordell Ave., Bethesda, Md., Consultant, Div. of Public Health Methods, U. S. Public Health Service

Harry M. Chester, M.A., Georgia Dept. of Public Health, 12 Capitol Square, S.W., Atlanta, Ga., Personnel Administrator

Felix R. Leycegui, D.D.S., Viena 26, Oficina de Especializacion Sanitaria, Mexico D. F., Mexico, Chief of Service, Dental Division, Public Health Dentistry

## DECEASED MEMBERS

Emily M. Duntz, Geneva, N. Y., Elected Member 1941, Public Health Education Section

G. W. Luckey, M.D., Austin, Texas, Elected Member 1924, Health Officers Section

George M. Price, M.D., New York, N. Y., Elected Member 1912, Elected Fellow 1922, Industrial Hygiene Section

## EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York, N. Y.

### U. S. CIVIL SERVICE COMMISSION

The Commission has announced again its need for public health nursing consultants in war work. The new announcement now provides for 5 grades and for appointments in the Children's Bureau, Department of Labor, U. S. Public Health Service, and Federal Security Agency. Salaries range from \$2,600 to \$5,600 a year. No age limits have been set. Positions exist both in the United States and foreign countries. War service appointments will be made to extend generally for the duration of the war and no longer than 6 months afterward. Duties are to carry out, in accordance with the rank of the position, nursing or nursing education programs; and to act in advisory capacity to Federal agencies, or to State, County, and municipal organizations.

There will be no written test, qualifications being judged solely from review of experience, education, and training of applicants. Persons applying must have completed a 4 year course in a recognized college and 1 year's special program of study in public health nursing approved by the National Organization for Public Health Nursing; must also have graduated from an accredited school of nursing affiliated with a hospital having a daily average of 100 or more bed patients; be registered nurses in a state or territory of the United States or the District of Columbia, and have had appropriate general public health nursing supervisory experience. Additional credit given for completion of approved college course in statistical analysis, public health nursing, supervision, social hygiene, tuberculosis control and maternity, pediatric or orthopedic nursing; also for certain appropriate experience as instructor, consultant, or investigator.

For positions in Children's Bureau additional progressive experience in spe-

cialized fields of maternal or child health is required for the top grade and may be substituted for part of the general experience prescribed for the other grades.

Applications must be filed with the U. S. Civil Service Commission, Washington, D. C., and will be accepted until the needs of the service have been met. Forms may be obtained direct from the Commission or at any first or second class post office.

Merit System Council, Oregon State Board of Health and Crippled Children's Division, has announced merit examinations in practically all professional public health fields, including Health Officers, Nurses, Sanitary Engineers, Laboratory Workers, Vital Statisticians, Consultants in the fields of Health Education, Hearing and Vision, Nutrition, Oral Health and Physiotherapy. Two clerical positions, Fiscal Worker and Administrative Clerk are included in this list as is also the position of Merit System Personnel Technician.

Interested persons may get full particulars regarding the positions and examinations by writing H. J. Sears, Merit System Supervisor, P. O. Box 88, Portland, Ore.

The Indiana State Personnel Division, 141 South Meridian Street, Indianapolis, announces that applications may be filed at any time until further notice for the following positions:

Orthopedic Nursing Consultant I (women only)...	\$150-200 mo.
Physician I (General) .....	165-250 mo.
Physician II (General) ....	250-325 mo.
Physician II (Tuberculosis)	250-325 mo.
Physician I (Psychiatric)...	185-265 mo.
Physician II (Psychiatric)...	250-325 mo.
Local Public Health Director .....	300-360 mo.

### POSITIONS AVAILABLE

Western state department of health will consider applications from physicians to fill four existing vacancies among county health officers, one vacancy in venereal disease control and positions as

laboratory technicians. Write Box S, Employment Service, A.P.H.A.

Physician with either public health training or experience in local health de-

partment administration to serve as health director in a county or district health department in midwestern state. Salaries vary from \$4,000 to \$4,500 with \$500 to \$600 travel, flat rate. These are well established health departments. Write Box T, Employment Service, A.P.H.A.

County Public Health Nurses for New Mexico. Must have 4 months' post-graduate instruction under one of the recognized public health nursing courses and 1 year's experience. Must drive and have a car. Address inquiry to State Health Department, Santa Fe, N. M.

#### PUBLIC HEALTH ENGINEER

Responsible professional public health engineering involving field investigations

and office studies in the application of sanitary measures. The more difficult engineering and sanitation field surveys include supervision over public water supplies, sewerage systems and sewage treatment plants and review of plans for same, and promotion and supervision of sanitation programs. Minimum qualifications: Training and experience equivalent to 3 years' civil engineering experience, including 2 years in public health or sanitary engineering; or completion of an academic year of graduate study and a year's experience in sanitary or public health engineering; and graduation from a college of recognized standing with a major course in civil or sanitary engineering. The salary range is \$205 to \$250 per month depending upon experience. Apply Box E, Employment Service, A.P.H.A.

#### THE AMERICAN RED CROSS NEEDS EDUCATORS

The American Red Cross will employ hundreds of social welfare workers and educators before January, 1943. These new employees will perform Red Cross services to the military units both in this country and with the task forces abroad.

Red Cross workers give counsel to the men in the armed forces about their personal and family problems, plan and organize recreational activities. They interpret Red Cross service to the military authorities. They act, to quote U. S. Army regulations, "in matters of voluntary relief and in accord with the military and naval authorities as a medium of communication between the people of the United States of America and their Army and Navy."

New professional employees needed include:

Men—Field directors, to serve at the military and naval centers here and abroad to counsel and advise men in the service regarding personal and family problems.

Men and Women—Club directors, program directors, staff assistants to operate clubs in leave areas overseas, some who qualify through executive or administrative experience, others by experience comparable to the operation of a large community center, and still others who qualify through recreation training and experience.

Men—Assistant field directors for recreation, to serve with the task forces overseas, qualified to plan, organize, and promote recreational activities such as sports, games, social recreation, entertainments, arts and crafts, music, dramatics, and game rooms.

Women—Medical and psychiatric social workers, case workers and recreation specialists in military and naval hospitals both here and abroad.

Men and women assigned to the service in this country will receive from \$135 to \$200 per month; those stationed outside the United States receive from \$150 to \$275 plus an additional \$50 per month maintenance allowance in military centers and full maintenance in club work. Uniforms are provided. Those Assigned abroad are also provided with certain insurance protection.

Those interested in receiving further information or in making application for a position in the American Red Cross Services to the Armed Forces program should communicate with: Personnel Service, National Headquarters, American Red Cross, Washington, D. C.

Those interested in a position within continental United States only should apply to the nearest Red Cross area office. They are as follows:

North Atlantic Area, 300 Fourth Avenue, New York, N. Y.  
Eastern Area, 615 N. St. Asaph Street, Alexandria, Va.  
Midwestern Area, 1709 Washington Avenue, St. Louis, Mo.  
Pacific Area, Civic Auditorium, San Francisco, Calif.

#### THE AMERICAN NATIONAL RED CROSS WASHINGTON, D. C.

#### OTHER VACANCIES

Southwestern state health department seeks 2 physicians for assignment to district health units, personally to conduct several small venereal disease clinics on a rotating schedule. Experience preferred but not required. Salary \$3,000, plus actual travel allowance not to exceed \$1,200. Write Box V, Employment Service, A.P.H.A.

Wanted: Supervisor of generalized public health nursing staff of 6 to 8 nurses. Beginning salary \$175 per month, with opportunity for increase to \$220 and travel expenses. Must be high school graduate, graduate of hospital of 100 beds, and must have at least 1 year's postgraduate study in public health nursing at a recognized institution, and

2 years' experience in general public health nursing under qualified supervision. Apply Box L, Employment Service, A.P.H.A.

The New Mexico State Department of Public Health will consider applications for the position of obstetrical consultant, Maternal and Child Health Division. Address inquiries to the State Department of Public Health, Santa Fe, N. M.

Bacteriologist with Ph.D. or equivalent and teaching experience wanted in western state university. Must be immune to

military service call. Salary about \$2,500. Write Box A, Employment Service, A.P.H.A.

Wanted: Nurse for county health work. Salary \$1,800 per year with travel allowance (additional) of \$500 per year. Address District Health Department 2, West Branch, Mich.

Wanted: Chemical or Ceramic Engineer or Geologist for Occupational Disease work, Division of Industrial Hygiene, State Board of Health, Raleigh, N. C.

### POSITIONS WANTED

#### ADMINISTRATIVE

Teaching or administrative position desired by physician, aged 48. Experienced teacher in preventive medicine and public health, now employed at prominent medical school; 20 years' experience in municipal health administration and epidemiology. A-491

Physician, B.S., M.D., and M.S.P.H., University of Michigan, aged 35, experienced city-county health administration and as director university student health service. Will consider permanent responsible position offering good income. A-492

Physician with 25 years' full-time experience in public health administration is available for immediate appointment. Moderately hard of hearing; otherwise fully able. Salary \$4,500 or better. A-497

Physician, M.D., C.P.H., aged 47, seeks position in administrative work. Experienced in venereal disease control and industrial medicine. A-485

Physician, aged 47, M.D., Creighton University, M.S.P.H., Michigan, experienced in school health and as director of county health unit, seeks position as administrator in state or local health department. A-498

Physician, aged 37, M.D., McGill, D.P.H., Toronto, experienced as health officer and director of public health training, seeks position in administrative work. A-499

#### WOMEN PHYSICIANS TRAINED IN PUBLIC HEALTH

Woman, aged 34, M.D., University of Basle, Switzerland, M.S.P.H., DeLamar

Institute, Columbia University. U. S. citizen. Excellent references. Especially interested in industrial hygiene. A-493

Woman, aged 41, M.D., Columbia University, M.S.P.H., DeLamar Institute, experienced in epidemiology and research, seeks position offering administration experience. A-494

Woman physician, aged 48, M.D., University of Vienna. Excellent European pediatric experience. Seeks position in pediatrics, administration or statistical research. A-495

Woman physician, M.D., Rush, M.P.H., Michigan, 13 years' experience in school medical service and administrative county health unit, seeks administrative position. New York area preferred. A-500

Woman physician, aged 29, M.D. Women's Medical, M.P.H. Johns Hopkins. Specially interested in industrial medicine and public health administration. Has had residency in tuberculosis. A-501

Mature woman physician, licensed in California, Minnesota and Indiana, desires to care for the aged, mentally disturbed, handicapped, epileptic, arthritic, etc., in the home or institution. A-505

#### HEALTH EDUCATION

Woman with master's degree in health education, 12 years' successful experience in public school and college teaching, administration and research. Will consider position in normal school, public schools, or in official or nonofficial health agencies. Prefers South or East. Available at once. H-501

## INDUSTRIAL HYGIENE

Industrial hygiene chemist. Experienced in sampling, analysis of toxic industrial gases and fumes; petrographic dust analysis; dust counting; general toxicological analysis; chemical microscopy; also experienced in making industrial hygiene surveys, with knowledge of German, French, and Spanish. Six years' experience. Desires position. I-457

## LABORATORY

Man, aged 28, A.B., M.S. in animal parasitology, Ph.D. in human parasitology and tropical diseases. Two years' experience in charge of parasitological diagnosis and research in state laboratory. Research publications; teaching experience. Desires teaching position in university with opportunity to do research. L-463

## MISCELLANEOUS

Veterinary Doctor, M.P.H., University of Pennsylvania, aged 27, with 2 years of practice, seeks position in food, meat, milk or livestock sanitation with state or local health department. Also interested in teaching position with research facilities. M-451

Public Health Nurse with M.A. degree wishes position in health supervision and teaching in college or public school. West preferred. M-452

Administrative Assistant or Health Educator, woman, M.A., 10 years' experience in health agency offices; 7 years' teaching experience, writer on health and other subjects, experienced in independent research, some training in social work, some hospital experience. M-453



## NEWS FROM THE FIELD

### CRITERIA FOR DETERMINATION OF ESSENTIAL LIST OF PUBLIC HEALTH PHYSICIANS

THE Directing Board, Procurement and Assignment Service, has addressed to all State Chairmen for Physicians the following memorandum and has authorized its publication.

The Directing Board has approved the following recommendations made by the Advisory Committee on Public Health of which the members are: Carl V. Reynolds, M.D., State Health Officer, Raleigh, N. C., *Chairman*; Harry S. Mustard, M.D., DeLamar Institute of Public Health, New York, N. Y.; Reginald M. Atwater, M.D., Executive Secretary, American Public Health Association; Waller S. Leathers, M.D., Vanderbilt University, Nashville, Tenn.; and John L. Rice, M.D., Deputy Commissioner of Health, New York, N. Y., and President, American Public Health Association.

"A physician should be considered essential to civilian public health interests and, therefore, not available for military duty provided he comes within one of the two following categories:

- "1. A full-time medical officer in charge of a health service of a governmental unit or administrative district, such as state, district, county, and city.
- "2. Full-time heads or chiefs of administrative units within a health department. For example: tuberculosis, venereal diseases, maternal hygiene, infant care, epidemiology, vital statistics, etc.

"Methods of rendering health service differ throughout the states; public health problems vary with localities, population densities, and in terms of war industries, military centers, etc., which may create special problems where located. The committee, therefore, does not deem it feasible to submit any specific recommendations for

nation-wide application as to the essentiality of full-time medical officers serving health departments in capacities other than those in the two groups set forth above.

"In view of these facts, this committee recommends that the designation of physicians as essential in capacities other than those described above be determined after conference between the administrative chief of the health department concerned and the State Chairmen of Procurement and Assignment Service with the provision that except under unusual circumstances, physicians under 37 years of age—except for those specified in paragraphs 1 and 2 above—should be released for military service, their places to be taken by older persons or by those not eligible for service with the armed forces. Special consideration, however, shall be given to trained health officers who have had two or more years of training and service in public health. Furthermore, some of these who may not be essential locally may be needed by the U. S. Public Health Service for service elsewhere.

"If a State Chairman considers a public health physician as available, he should state *when available*."

#### CONFERENCE ON VENEREAL DISEASE CONTROL NEEDS IN WARTIME

VENEREAL disease and America's war effort will be discussed by high-ranking medical officers of the War and the Navy Departments, prominent physicians, health officers and others at a Conference in Hot Springs National

Park, Ark., October 21-24, 1942. Headquarters will be at the Arlington Hotel.

The Conference will be held under the auspices of the U. S. Public Health Service in conjunction with the Eighth Annual Meeting of the American Neisserian Medical Society. Surgeon General Thomas Parran will preside. State and local health officers, venereal disease control officers, practising physicians, and all others engaged in venereal disease control activities are invited.

Subjects for discussion will include venereal disease control measures influencing the war effort, epidemiology of syphilis and gonorrhea—1942, wartime venereal disease control education, research influencing the wartime venereal disease control program, and technics of venereal disease education.

Governmental, professional, and health organizations to be represented at the Conference include: the War Department, the Navy Department, the Social Protection Section of the Office of Defense Health and Welfare Services, the American Medical Association, the American Neisserian Medical Society, the American Social Hygiene Association, state and local health departments, and the U. S. Public Health Service. This Conference has been set immediately preceding the 71st Annual Meeting of the American Public Health Association in St. Louis, October 27 to 30, in the expectation that many persons would be able to attend both Conferences.

#### SENATE GETS BILL FOR MORE CHILD AID

**P**RESIDENT ROOSEVELT asked Congress on August 25 to amend the Social Security Act to make more money available to the Children's Bureau for "special needs of mothers and children arising from war conditions." Legislation to accomplish this was immediately introduced.

The President pointed out that war needs have made such heavy demands on the funds available through the Children's Bureau that additional funds, now prohibited by limitations written into the Social Security Act, must be made available through the amendment of the Act.

The amendment would raise the monetary restrictions imposed on the Children's Bureau for child welfare and would give the bureau permission to send special personnel into emergency areas.

The sum needed by the Children's Bureau until next July would be about \$7,500,000. According to a statement issued by Katharine Lenroot, head of the bureau, this sum represents almost double the present amount expended yearly and would be distributed as follows:

For more adequate health and welfare supervision in war industry boom towns—\$4,250,000

For maternity care for wives of service men—\$750,000

For child welfare workers to be stationed in trailer camps, war industry communities and other overcrowded areas—\$2,000,000

Miss Lenroot pointed out that the allocation of money for the wives of service men was a new departure brought about by the requests of about 38 states for financial help in providing adequate maternity care for these women. One of the reasons for naming such a large sum for child welfare workers, Miss Lenroot said, was that the problem of juvenile delinquency was a growing and dangerous one in crowded areas.

The money will be disbursed through grants-in-aid to the states. President Roosevelt said:

"I make these suggestions for federal assistance to the states in full appreciation of the fact that the degree to which children are safeguarded in wartime depends chiefly upon the parents in our homes, the teachers

in our schools, and the citizens of our communities.

"It is my hope that in making our supreme war effort, parents and citizens will be at all times on guard to see that children are safeguarded to the utmost from the dangers of wartime and equipped to use and to cherish the freedom which we shall make secure for them."

Under the terms of the amendment, all supplementary appropriations obtained by the Children's Bureau for war work will be allotted to the states on the basis of need and the money will not have to be matched in amount by state funds.

#### NUTRITION FOUNDATION PROGRAM

THE Nutrition Foundation, Inc., New York, N. Y., an organization sponsored by food manufacturing concerns, announced recently through George A. Sloan, its President, the receipt of additional funds of \$75,000 from six new member organizations for the purpose of nutrition research, bringing the total of the Foundation's funds available for this purpose to \$923,500.

At the same time, Charles Glen King, Ph.D., Scientific Director of the Foundation, announced the establishment of *Nutrition Reviews*, a monthly journal of interpreted progress in the science of nutrition. Its purpose will be "to bridge the gap between basic research findings and their acceptance on the part of those who deal with the public and to enable the public to keep abreast of current progress and to have available an unbiased, authoritative review of current literature."

The editor of the new publication will be Frederick J. Stare, M.D., Assistant Professor of Nutrition and Biochemistry at Harvard Medical School and the Harvard School of Public Health. According to Dr. King, *Nutrition Reviews* will be so edited as to merit the full confidence of the medical and other professions, including that of dentistry, nutrition, health

workers in general, teachers, dietitians, science writers, and food technologists. Assistant editors will include Esther Batchelder, Bureau of Home Economics, Washington, D. C.; Franklin C. Bing, Council on Foods and Nutrition, American Medical Association; R. Adams Dutcher, Pennsylvania State College; Robert S. Goodhart, Nutrition Division, Office of Defense, Health and Welfare; Carl V. Moore, Washington University; and Elmer J. Stotz, Harvard University.

The editorial advisory committee of *Nutrition Reviews* will consist of Reginald M. Atwater, M.D.; Samuel W. Clausen, M.D.; George R. Cowgill, Ph.D.; Conrad A. Elvehjem, Ph.D.; J. Murray Luck, Ph.D.; James S. McLester, M.D.; Henry C. Sherman, Ph.D.; Russell M. Wilder, M.D.; and John B. Youmans, M.D.

#### RESOLUTIONS FROM THE CANADIAN PUBLIC HEALTH ASSOCIATION

AT its annual meeting in Toronto last June, the Canadian Public Health Association passed the following resolutions:

1. Be it resolved that the thanks of this Association be extended to the American Public Health Association for making possible, in coöperation with the W. K. Kellogg Foundation of Battle Creek, Mich., the conduct of the 5th Annual Canadian Rural Health Conservation Contest; and for their coöperation with the Metropolitan Life Insurance Company in providing, for the second year, the Canadian City Health Conservation Contest.
2. Be it resolved that the Canadian Public Health Association express to the American Public Health Association its appreciation of the Manitoba Health Study as a contribution to the promotion of provincial health departments in Canada.

#### PUBLIC HEALTH AS A FOUNDATION FOR PUBLIC MORALE

THE testimony of a panel of persons engaged in public health who were invited to appear before the Tolan Committee of the House of Representa-

tives, January 15, 1942 (*American Journal of Public Health*, February, 1942, pages 226-228), will be found available in Part 25 of the Washington Hearings of the Tolan Committee "Testimony relating to the maintenance of civilian morale," pages 9834-9884. The Hearings document the relationships between public health and morale in this country and in England and may be used as source material for those supporting health budgets, etc., during the emergency.

Following this testimony, an excellent statement on the activities and operations of the British Ministry of Health is included with the statement of the Right Honorable Malcolm MacDonald, High Commissioner for Great Britain in the Dominion of Canada. Mr. MacDonald during the blitzkrieg was British Minister of Health.

#### CLEVELAND HEALTH MUSEUM RECEIVES GRANT

FOR the second time the Cleveland Health Museum has received a grant from the Thomas H. White Trust Fund, in the amount of \$1,100. This grant has been made to establish a permanent exhibit on nutrition and health at the Museum. According to Dr. Bruno Gebhard, Director, the opening of the exhibit is scheduled for the early part of January, 1943.

#### KANSAS STATE BOARD OF HEALTH ELECTIONS

FORREST L. LOVELAND, M.D., Topeka, and Hugh A. Hope, M.D., Hunter, have been appointed members of the Kansas State Board of Health. George I. Thatcher, M.D., of Waterville, was reelected President of the Board and Harry L. Aldrich, M.D., Caney, was elected Vice-President at a recent meeting. Floyd Z. Beelman, M.D., Topeka, who has been Acting Secretary, was appointed as Secretary and Executive Officer. William Fred

Mayes, M.D., Kansas City, was appointed the Director of Child Hygiene, and Harry R. Ross, M.D., Topeka, was appointed Medical Consultant to the Board.

#### STANDARDS FOR MATERNITY CARE AND EMPLOYMENT OF MOTHERS IN INDUSTRY

THE Children's Bureau and the Women's Bureau of the U. S. Department of Labor have issued a statement on standards for maternity care and employment of mothers in industry. Copies can be obtained from the Children's Bureau in Washington.

It is the opinion of the Bureau and a group of consultants that the labor situation in the United States does not now necessitate the recruitment or employment of pregnant women or women with infants. However, because some women who are pregnant or who have young children may find it necessary to seek employment, a statement of policy has been formulated to serve as a working basis for those concerned with the problem.

The statement outlines the facilities for adequate prenatal medical care, recommends that pregnant women should not be employed between 12 midnight and 6 A.M., nor more than 8 hours a day or 48 hours per week. It is recommended that pregnant women should not be employed in occupations involving heavy lifting or continuous standing. Other conditions involving accident risks and exposure to toxic substances are listed. A minimum of 6 weeks' leave before delivery is recommended and at least 2 months' leave after delivery.

#### MICHIGAN DEPARTMENT OF HEALTH HAS NEW BUILDING

THE *Journal of the A.M.A.* announces that a new building has been erected for the State Department of Health on the northwest edge of

Lansing. The four story construction was financed by state funds of \$135,000, supplemented by WPA grants of labor and material. Eleven of the twelve bureaus of the state department are located in the new building. Laboratory personnel will continue to occupy the former quarters.

#### CLARA ELIZABETH FUND FOR MATERNAL HEALTH

A RECENT decision of the Trustees of the Clara Elizabeth Fund for Maternal Health, Flint, Mich., separates the Fund's activities from those of the Flint Department of Health. Heretofore the program of the Fund has been directed by Flint's Executive Health Officer. The Clara Elizabeth Fund was created by a gift of General William S. Knudsen in 1937, when he was President of General Motors, to improve maternal health conditions in Flint and Genesee County. The classes designed to prepare both men and women for the responsibilities of parenthood were begun in 1939. Several meetings have been held each week since that time. More than 2,500 women and over 1,200 men have been enrolled in this unique educational program. The new arrangement decided upon by the Trustees does not alter the educational emphasis that has been the Fund's policy from the beginning. David B. Treat, who was Director of Health Education for the Fund, has been appointed its Director.

#### DIRECTOR OF MENTAL HYGIENE APPOINTED

DR. GERHARD B. HAUGEN of Portland, Ore., has been appointed Director of the Division of Mental Hygiene, established last year under the supervision of the U. S. Public Health Service. The new unit was set up by Dr. Curtis R. Chaffin, Portland, of the Public Health Service, who has been Acting Director. Dr. Chaffin is now

transferred to the U. S. Marine Hospital at Ellis Island, N. Y. Dr. Haugen is a graduate of the University of Oregon Medical School and has recently completed a year at Johns Hopkins University School of Hygiene and Public Health.

#### INDIANA SERUM CENTER CLOSED

THE Indiana State Department of Health has decided to close its serum centers, now located in different sections of the state, and distribute serum directly from the State Board of Health. The serum will be available on request and it is believed the new plan will not interfere with prompt delivery. This decision was made on the basis of a survey and the opinion of the pneumonia control committee of the State Medical Association.

#### "SNAPSHOTS OF DEATH"

THE U. S. Bureau of the Census, Washington, has announced the Mortality Summaries, a new series of releases in the *Vital Statistics Special Reports*, which will present statistical summaries for the more important causes of death. Each mortality summary will deal with a particular disease or cause of death and will give concisely in a few pages most of the salient facts about that selected cause. Each Mortality Summary contains in a compact and convenient 4 page release the essential information about one particular cause of death. Included in the tables are trends for the period 1900-1940, age-specific death rates, death rates by sex and race, death rates by month, contributory causes of death, death rates by place of residence, and other features.

Among the special reports already issued and available from the Bureau of the Census are Mortality Summaries on all causes of death, typhoid and paratyphoid fever, scarlet fever, whooping cough, diphtheria, tuberculosis, dysen-

tary, malaria, syphilis, measles, cancer, diabetes, exophthalmic goiter, pellagra, alcoholism, intracranial lesions of vascular origin, diseases of the heart, chronic rheumatic diseases, bronchitis, pneumonia and influenza.

#### NEW YORK UNIVERSITY COURSES IN INDUSTRIAL SAFETY

**I**N coöperation with the Greater New York Safety Council and the Newark Safety Council, the New York University Center for Safety Education will conduct during the 1942-1943 school year four special courses which have been designed to provide advanced training in industrial accident prevention and first-aid instruction for insurance and industrial engineers, inspectors, and others concerned with problems of industrial safety.

Instructors for the courses will include leaders in industrial safety and hygiene. The course coördinators will be Dr. Walter Cutter and C. Don Modica of the staff of the Center for Safety Education.

#### PERSONALS

##### Central States

ROLAND M. ATHAY, M.D., of Detroit, Mich., was appointed Medical Co-ordinator for the Wayne County Department of Social Welfare on May 26.

ALBERT C. BAXTER, M.D.,\* of Springfield, Ill., formerly Illinois State Health Officer, has been appointed State District Health Officer with headquarters in Pana.

WILLIAM H. CAMERON, Chicago, Ill., Managing Director of the National Safety Council for the last 30 years, has retired, and has been succeeded by NED H. DEARBORN, Ph.D., of New York, N. Y., who has been named Executive Vice-President and Managing Director. Dr. Dearborn

has been Dean of the Division of General Education of New York University since 1934 and has been actively interested in accident prevention, having been Vice-President for Education of the National Safety Council for two years.

GARRETT J. FLANAGAN, M.D., of Kaukauna, Wis., has been appointed City Health Officer, to succeed CHARLES D. BOYD, M.D.

DENMAN T. GAMMELL, M.D., of Ulysses, Kans., has been named Health Officer of Grant County.

H. H. GERSTEIN, CH.E.,\* of Chicago, Ill., has entered the Sanitary Corps of the U. S. Army, as of August 31. He was Sanitary Engineer in charge of the water safety control section of the Bureau of Engineering of the City of Chicago for the last 17 years.

GILSDORF GROFF, who has just completed his training for a Master of Public Health degree at the University of Michigan, has been appointed Engineer for the Regional Health Service at Valley City, N. D. With the exception of a 9 months' educational leave, Mr. Groff has been with the North Dakota State Department of Health since 1938 as Engineer in Charge of Laboratory Service.

G. R. HARRIS, formerly Superintendent of Public Health for the City of Detroit, Mich., has been appointed Hospital Administrator at the Herman Kiefer Hospital, Detroit; and FRANKLIN H. TOP, M.D., D.P.H.,\* Director of the Division of Communicable Diseases and Epidemiology of the Detroit City Department of Health and the Hospital, has been named Medical Director.

ELMER L. LAMPE, M.D., of Bellevue, Ia., has been appointed Health Officer of Lamotte.

JOHN L. LAVAN, M.D.,\* Health Commissioner of Toledo, Ohio, has been granted a leave of absence to accept active duty as Commander in the

\* Fellow A.P.H.A.

† Member A.P.H.A.

Medical Corps of the U. S. Navy. OTTO F. C. LEHMBERG, M.D., Columbia City, Ind., has entered the Army Medical Corps and has been succeeded as Health Officer of Whitley County, by ARTHUR LEITER, M.D., of Columbia City.

HERMAN M. LYNCH, M.D., has been appointed Health Officer of West Bend, Wis., filling the vacancy caused by the resignation of WILLI-BALD J. WEHLE, M.D.

CARL W. PLOWMAN, M.D., of Jewell, Kans., has been appointed Health Officer for Jewell County, succeeding the late SPENCER B. DYKES, M.D., of Esbon.

SHERMAN T. ROGERS, M.D., has been appointed Health Officer of New Albany, Ind., succeeding ADDIS N. ROBERTSON, M.D., resigned.

VIOLA RUSSELL, M.D.,† who has been Director of Maternal and Child Hygiene of the North Dakota State Department of Health, Bismarck, N. D., since January 1, 1940, has resigned to accept the position of Director of Maternal and Child Hygiene for the Vermont State Department of Health.

FLORENCE LEE SCOTT has just been appointed Orthopedic Nursing Consultant by the North Dakota State Department of Health and the State Board of Public Welfare, according to Dr. F. J. Hill, Acting State Health Officer, and E. A. Willson, Executive Director of the State Welfare Board. She will divide her services equally between the two state departments. Mrs. Scott was Public Health Nurse for LaMoure County from 1939 to 1941, at which time she was granted a leave for a special course in orthopedic nursing at Western Reserve University.

E. L. SEDERLIN, M.D.,† formerly Health Officer for Fargo, N. D., will

be the Regional Health Officer at Valley City, N. D., replacing R. G. WHITE, M.D.,\* now located at Bismarck.

JEROME SVORE, Sanitary Engineer for the Regional Health Service at Valley City, N. D., has been appointed State Milk Sanitary Engineer with the North Dakota State Department of Health at Bismarck. Mr. Svore joined the State Health Department staff November 8, 1938. Prior to his appointment with the Health Department, he was Assistant Construction Field Engineer for 13 counties in the Mandan District of the WPA.

ARTHUR F. WEYERBACHER, M.D., has been appointed to the Indianapolis Board of Health for a 4 year term succeeding GEORGE W. KOHLSTAEDT, M.D., resigned.

R. G. WHITE, M.D.,\* Health Officer for the Regional Health Service, at Valley City, N. D., has been appointed Director of Maternal and Child Hygiene for the North Dakota State Department of Health, as of September 15. Dr. White came to North Dakota on September 1, 1937, from Detroit, Mich., where he served as School Health and Medical Coordinator for the Detroit Health Department from 1930 to 1935, and Director of the School Health Service at Ann Arbor, Mich., from 1935 to 1937. He will be located at Bismarck.

EDWARD W. ZEMAN, M.D., has been appointed Health Director of Hibbing, Minn.

#### Eastern States

TRAVIS P. BURROUGHS, M.D., M.P.H.,\* Secretary of the New Hampshire State Board of Health, Concord, has resigned, effective August 31, and has been commissioned a Surgeon in the Reserve of the U. S. Public Health Service, where he is now on

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duty. He is succeeded by ALFRED LEO FRECHETTE, M.D., M.P.H.†

BERNARD D. DAITZ, M.S.P.H.,† formerly Field Consultant for the New Jersey Tuberculosis League, Newark, N. J., is on active duty with the U. S. Army, and is at the 64th Station Hospital, Fort Jackson, S. C.

ALFRED LEO FRECHETTE, M.D., M.P.H., for some years Deputy State Health Officer in New Hampshire, has been appointed by the New Hampshire State Board of Health as Secretary of the State Board of Health, succeeding TRAVIS P. BURROUGHS, M.D., M.P.H.,\* resigned. Dr. Frechette is a graduate in medicine from the University of Vermont and of the Harvard School of Public Health, from which he received the M.P.H.

CHARLES E. GILL, M.D.,† State District Health Officer, Massachusetts State Department of Health, Westfield, has been inducted as Major in the Army Medical Corps and is temporarily stationed at Lovell General Hospital, Camp Devens, Mass.

JOHN B. HOZIER, M.D., of Boston, Mass., has been detailed as Acting Director of the Division of Genito-infectious Diseases in the Massachusetts Department of Health. He succeeds ERNEST B. HOWARD, M.D., M.P.H.,† who is now a special venereal disease control officer for the U. S. Public Health Service.

GUSTAVUS H. KLINCK, JR., M.D., of Troy, N. Y., was chosen President of the New York State Association of Public Health Laboratories, at its meeting in Schenectady, May 18.

PAUL O. KOMORA, of New York, N. Y., was recently appointed Assistant Secretary of the New York State Department of Mental Hygiene, Albany, N. Y., effective August 1. He had been Associate Secretary of

the National Committee for Mental Hygiene.

ESMOND R. LONG, M.D., Ph.D.,\* Professor of Pathology, University of Pennsylvania School of Medicine, Philadelphia, Pa., and Director of the Laboratories of the Henry Phipps Institute, has recently been elected an honorary member of the Society for the History of Medicine, Buenos Aires, Argentina.

STEPHEN V. LUDDY, D.D.S., M.P.H.,† of Philadelphia, Pa., has been appointed Dental Director for the North Dakota Public Health Department, Bismarck, N. D., effective July 15. Dr. Luddy graduated February 15, 1941, from the School of Public Health of the University of Pennsylvania, where he received the degree of Master of Public Health.

DR. GEORGE W. PATTERSON, Professor in Bacteriology and Director of Athletics at the Philadelphia College of Pharmacy and Science, Philadelphia, Pa., was chosen President of the Alumni Association of the College, for the ensuing year, at the recent annual meeting.

REUBEN F. REIDER, M.D., D.P.H.,† of New York, N. Y., U. S. Public Health Service, has been named Health Officer of the Champaign-Urbana Health District, succeeding WALTER C. EARLE, M.D.,\* of Champaign, who has been granted a leave of absence to do special work for the federal government, it is reported.

EDWARD S. ROGERS, M.D., M.P.H.,\* Assistant Commissioner, New York State Department of Health, Albany, has been made Director of the Office of War Nutrition Services in the State War Council, Albany, as an additional assignment from his duties in the Department of Health. The State War Council includes the interests of 6 departments or other agencies of the State Government as they participate in an extensive

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nutrition program. The aim is immediate concentration of all available resources and personnel on the problem of nutrition of war workers in industry.

FREDERICK FULLER RUSSELL, M.D.,\* Professor of Preventive Medicine and Epidemiology, emeritus, Harvard Medical School, Boston, Mass., was awarded the honorary degree of Doctor of Science by the University of Rochester, N. Y., at its annual commencement exercises, May 11.

DAVID D. RUTSTEIN, M.D.,† who has been Chief of the Cardiac Bureau of the New York State Department of Health, Albany, has been appointed on the staff of the Office of Civilian Defense, Medical Division, Washington, to organize instruction for physicians as Medical Gas Officer.

JOSEPH J. SMITH, M.D., of Easton, Conn., has been named Health Officer of Easton, succeeding WILLIAM H. COON, M.D.

FREDERICK J. STARE, M.D.,† has been announced by C. Sidney Burwell, M.D., Dean of the Harvard Medical School, Boston, Mass., as Assistant Professor of Nutrition. Dr. Stare is a graduate of the University of Chicago, 1940.

VESTA L. STONE, R.N.,† Executive Secretary of the Northern Worcester County Public Health Association, has presented her resignation, to be effective when her successor has been installed.

LAWRENCE M. TIERNEY, M.D., has been appointed Health Officer of West Haven, Conn., succeeding EUGENE N. COZZOLINO, M.D.

MYRON E. WEGMAN, M.D.,† formerly of San Juan, Puerto Rico, and now with the New York City Bureau of Child Hygiene, will direct a training unit at the Kips Bay-Yorkville Health Center to train new physicians em-

ployed by the Bureau to replace staff members called into military service. ISRAEL WEINSTEIN, M.D.,\* Assistant Director, Bureau of Health Education, New York City Department of Health; Major, Medical Reserve Corps, U. S. Army, is on military leave from the Department of Health for active service in the Army.

### Southern States

N. G. ANGSTADT, M.D.,† of Fayetteville, has been made Director of the State Bureau of County Health Work of the West Virginia State Health Department, Charleston. Dr. A. M. Price has been Acting Director of this bureau since the Director, Dr. Bruce H. Pollock, joined the Navy. Dr. Angstadt has been Director of the Fayetteville County Health Department for several years. He is being succeeded by DON V. HATTON, M.D., formerly Director of the Wetzel County Health Department and recently returned from Johns Hopkins, where he received his M.P.H. degree.

WALLACE E. BAKER, M.D., of Petersburg, Va., has been appointed Assistant Epidemiologist in the Division of Venereal Disease Control of the Virginia State Department of Health.

BESSIE MAE BEACH, M.D.,† Associate in charge of the Division of Child Hygiene of the Alabama State Department of Health, has been appointed Regional Medical Consultant in maternal, child health and crippled children services of the Children's Bureau of the U. S. Department of Labor, with headquarters in New Orleans, La.

RALPH G. BEACHLEY, M.D.,\* of Arlington, Va., who has been Director of Public Welfare and Health in Arlington County since 1938, has now been appointed Assistant Chief Medical and Liaison Officer for the metropolitan area, succeeding the late Dr.

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- WILLIAM B. KING. He was recently appointed Regional Consultant on Emergency Medical Service for northern Virginia.
- PAUL W. BOWDEN, M.D., M.P.H.,† Acting Health Officer of Charlotte County, has been appointed Epidemiologist for Richmond, Va.
- LOUIS A. BREFFEILH, M.D.,† of Marks-ville, La., head of the Avoyelles Parish Health Unit, has been appointed in charge of the Iberia Unit, with headquarters at New Iberia, succeeding CHRISTOPHER L. MENGIS, M.D.,† who recently became President of the Louisiana State Board of Health.
- DAVID E. BROWN, M.D., of New Orleans, La., has been appointed State Health Officer and President of the Louisiana Board of Health, succeeding CHRISTOPHER L. MENGIS, M.D.,† of New Orleans. Dr. Mengis will continue his association with the Board as Assistant State Health Officer, and Director of the Division of Local Health Service. Dr. Brown is a graduate of Memphis Hospital Medical College.
- T. H. BRUCE, M.D., C.P.H.,† Director of the Hancock County Health Department, West Virginia State Department of Health, has resigned his position to enter the Army.
- WILLIAM G. CARNATHAN, M.D., of Henderson, Tex., has been appointed Health Officer of Rusk County, succeeding JESSE E. ROSS, of Henderson, who has accepted a commission in the U. S. Navy.
- FRANCIS B. CARROLL, M.D., D.M.D., M.P.H.,† recently Camp Epidemiologist at Fort Knox, Ky., was transferred on June 15 to the Preventive Medicine Section, Surgeon General's Office, War Department, Washington, D. C.
- JOHN S. CHAMBLEE, M.D., of Windsor, N. C., Health Officer for Bertie and Chowan Counties, will take over the work in Gates County, succeeding THOMAS G. FAISON, M.D.,† of Winton, Health Officer for Hertford and Gates Counties, who has entered active service.
- WILLIAM E. CHAPIN, M.D., of Richmond, Va., has been named to succeed WALLACE E. BAKER, M.D., of Petersburg, in his former position of Field Epidemiologist for the Camp Lee area, with headquarters in Petersburg.
- FRANCIS J. CLEMENTS, M.D.,† of Stony Creek, Va., has been named Health Officer of the new health district comprised of Dinwiddie County and Sussex-Prince George Counties.
- ERNEST A. COOK, M.D.,† recently Director of a health unit in Alabama, has been appointed Director of the Okaloosa-Walton County Health Department, with headquarters at DeFuniak Springs, Fla.
- GEORGE W. CRESWELL, M.D., has been appointed a special consultant in the Division of Venereal Diseases, U. S. Public Health Service, Washington, D. C.
- J. T. DUNCAN, M.D., of Columbia, Ky., who has been Health Officer of Adair County since 1937, has resigned to become Director of the Bureau of Tuberculosis of the West Virginia State Department of Health, Charleston, effective July 1. Dr. Duncan will have charge of the Mobile Tuberculosis X-ray Unit operated by the Division of Communicable Disease Control of the Health Department.
- BEVERLY L. HOLLADAY, M.D., of Wytheville, Va., has resigned as Health Officer of Wythe County, effective April 1.
- DANIEL HOPE, JR., M.D., of Lawrenceville, Va., formerly Assistant Health Officer of the Brunswick-Greenville-Mecklenburg Health District, has

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been appointed Health Officer of the Alleghany-Botetourt Health District, with offices in Covington, succeeding WYATT E. ROYE, M.D.,† of Covington, who has been transferred to the Tuberculosis Outpatient Service of the Virginia State Health Department, at Richmond.

THOMAS H. JOHNSTON, M.D., formerly of Douglas, Ga., has been appointed Director of the Ontonagon-Baraga County Health Unit, succeeding ROLLA J. SHALE, M.D., M.S.P.H.,† of Ontonagon, who has gone to Florida.

GILBERT L. KELSO, B.A.† has been named sanitary chemist in charge of stream pollution with the State Water Commission of West Virginia. Mr. Kelso, who has recently returned from Minnesota where he did post-graduate work, takes the place of KENNETH H. WATSON, who is now in the Army. Mr. Kelso was formerly a member of the staff of the West Virginia Public Health Training Center at Morgantown.

J. H. MASON KNOX, JR., M.D.,\* of Baltimore, Md., who recently retired as Director of the Maryland State Bureau of Child Hygiene, has been appointed Consultant in Child Hygiene. At a recent dinner marking his retirement, Dr. Knox was presented by his colleagues with a bound portfolio of his own work, including reprints of articles, addresses and reports of special studies.

L. A. MACLEAN, M.D., D.P.H.,† Director of the Monongalia County Health Department, West Virginia Department of Health, Morgantown, has been transferred to the Brooke County Health Department, succeeding DR. W. H. BOOHER, who has gone into the Army. Dr. MacLean will be replaced by DR. W. B. BAILEY, who has been loaned to the

West Virginia State Health Department by the U. S. Public Health Service.

FRANK A. MOORE, M.D.,† of Jackson, Tenn., has resigned as Regional Health Officer of West Tennessee, to become a captain in the U. S. Army Medical Corps.

PAUL Q. PETERSON, M.D.,† of Hardinsburg, Ky., has been transferred from his position as Health Officer of Hancock to a similar position in Warren County. He will succeed LEWIS FINE, M.D., of Bowling Green, who is retiring from the work because of ill health.

LESTER M. PETRIE, M.D.,† of Atlanta, Ga., has been named Director of the Industrial Hygiene Service recently created in its Division of Preventable Diseases by the Georgia State Department of Health.

STANLEY BROOKS RUSSELL, A.B.,† Statistician and Assistant Director of the Bureau of Records and Vital Statistics, Jefferson County Board of Health, Birmingham, Ala., has been commissioned First Lieutenant in the Army of the United States, and is now serving in the Bureau of Preventive Medicine, in the Office of the Surgeon General.

WILSON T. SOWDER, M.D., M.P.H.,† of Tampa, Fla., U. S. Public Health Service, who was Health Officer of Hillsborough County, has been placed in charge of the Bureau of Venereal Disease Control of the Florida State Board of Health. He succeeds LEO C. GONZALES, M.D., of Jacksonville, who has been in charge of the work for the last 4 years and who, it is reported, was to retire on May 1 to engage in private practice in Tampa.

J. FRANK TAYLOR, of Martin, Tenn., has been appointed State Supervisor of Health and Physical Education, to carry on the physical education program of the Tennessee State Department of Education.

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WILLIE B. TRAMMELL, M.D., of Statham, Ga., has been named Health Commissioner in the newly established unit in Gwinnett County, with headquarters in Lawrenceville.

FRED J. WAMPLER, M.D.,\* Professor of Preventive Medicine at the Medical College of Virginia, Richmond, Va., since 1928, has been named Professor of Preventive and Industrial Medicine.

#### Western States

FRANCIS RHOADS has resigned his position as Director of Vital Statistics with the State of Washington Health Department, Seattle, to accept a position as Director of the Division of Vital Statistics in the West Virginia State Health Department, effective July 6.

CHARLES E. SHEPARD, M.D.,\* Professor of Hygiene and Director of Student Health at Stanford University School of Health, Palo Alto, Calif., has been called to active duty with the U. S. Public Health Service with the title of Surgeon, and is attached to the staff of FRED T. FOARD, M.D.,\* San Francisco, Calif.

HAROLD B. STOUT, M.D., formerly of Pateros, Wash., has been appointed Health Officer for Douglas County, Ore.

#### Hawaii

KUM PUI LAI has been appointed Acting Executive Secretary of the Territorial Tuberculosis Association, Territory of Hawaii, it has been announced.

THEODORE R. RHEA, C.P.H.,† left his position, August 1, with the Tuberculosis Association of the Territory of Hawaii, to become Director of Palama Settlement. This position was originally held by PHILIP S. PLATT, C.P.H., PH.D.\*

#### Puerto Rico

ANTONIO FERNOS ISERN, M.D., has been appointed as Commissioner of Health of Puerto Rico as of August 1, it has been announced. Dr. Fernos was Commissioner of Health of Puerto Rico for a period ending in 1933. He succeeds EDUARDO GARRIDO MORALES, M.D., DR.P.H.,\* who has been Commissioner since 1933 until his recent resignation to enter the armed forces of the United States as a Major in the Medical Corps. ACOSTA VELARDE, M.D., was Acting Commissioner of Health during July.

#### DEATHS

ALLEN JONES JERVEY, JR., M.D., of Tryon, N. C., formerly District Health Officer for Rutherford and Pope Counties, S. C., 1st Lieutenant, Medical Reserve Corps, U. S. Army, died June 17 somewhere in the Pacific of gunshot wounds.

WINFIELD CAREY SWEET, M.D., of New York, N. Y., since 1921 a staff member of the International Health Division, Rockefeller Foundation, who has worked in China, Australia, Ceylon, and India, died May 20 in Bolivia of heart disease.

## CONFERENCES AND DATES

American Academy of Ophthalmology and Otolaryngology. Chicago, Ill. October 11-14.

American Academy of Physical Medicine.

Boston, Mass. October 14-17.

American Association for the Advancement of Science. New York, N. Y. December 28-January 2.

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### Health Education in Extra-Cantonment Zones<sup>\*</sup>

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SHIFTING soldier and civilian populations, housing shortages, prostitutes in battalions, and mushroom cafes by the score have forced extra-cantonment zones to take on the character of buffer states and given health officials the grave responsibility of maintaining health communities under the most unusual circumstances. But war has not really changed the basic principles upon which health programs are built; it has, however, demanded a recognition of special problems and a readjustment of all programs to cope with immediate needs.

I shall here describe a demonstration in community health education that is under development in the war areas of North Carolina.

Because the principal objective of the demonstration is to focus the attention of the public on health problems that have arisen and are arising in the war areas, those concerned with its planning

and organization recognized from the beginning that the best way to develop a health education program at this time was to relate it to the war effort and to utilize the untapped reservoir of lay leadership that is always present in a community.

The demonstration was launched early last fall when twenty-five of the leading women in one town were interviewed by a health education consultant, loaned to the State Board of Health by the U. S. Public Health Service and assigned to the county health department. The women were asked if they were at all concerned over the physical condition of the young men of the nation, as indicated by the draft figures, and whether they planned to do anything about the condition in their own community. They were also asked what they thought about other local health problems and whether they would be willing to sponsor a health education program in order that they might become better informed about these problems and their relation to defense. Every woman interviewed felt that there was a need for such a

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<sup>\*</sup> Read before the Public Health Education Section of the American Public Health Association at the Seventy-first Annual Meeting in St. Louis, Mo., October 28, 1942.

program and that a special effort should be made to develop one.

Upon completion of the interviews, a meeting was scheduled to which all the women of the community were invited. At this assembly it was decided that one organization designed for an all-out effort should be formed. A Central Planning Committee was elected to work out a plan of action and report back to the whole group. After that was done, at a subsequent meeting the organization selected as its name, "Woman's Committee Health Education Program for Defense" and listed the following as its objectives:

1. To make the town "the healthiest in North Carolina" by improving and protecting the health of every man, woman, and child in it.
2. To organize all the women, both white and Negro, into neighborhood study groups to prepare them for any emergency.

To make those objectives possible, the local Central Planning Committee devised a plan of action to reach every woman in the community. They divided the town into districts and then further subdivided the districts into blocks or neighborhood areas and selected a chairman for each. The "block" chairman accepted the responsibility of visiting every woman living in her area and inviting her to enroll in a neighborhood study group. The study groups were then scheduled to meet monthly at the home of the "block" chairman, to study and discuss health problems. Motion pictures and printed materials were provided for the meetings by the local health department.

Preceding the monthly neighborhood meetings, all the chairmen met to receive instructions and review the materials selected for group study. A representative from the local health department assisted with the meetings. Subjects selected by the committee for study were those of particular impor-

tance to the war area and included: the venereal diseases, nutrition, tuberculosis, dental care, sanitation, cancer, and colds.

The Negro population was reached through the same type of organization as the white and was given identical service by the local health department.

During November in addition to the regular monthly meetings, the Woman's Committee planned and operated a "Quiz Corner" under a famous old market house in the center of town. Although the "Corner" did not open officially until 10:00 a.m., volunteer workers began putting up exhibits and posters at 4:30 a.m., and other volunteers reported for duty throughout the day. The chairman for the day, who is a member of the Central Planning Committee, arrived at the "Corner" with a group of Boy Scouts at 7:30 a.m. and it was only after the last exhibit had been taken down, close to midnight, that she left her post.

The program was in charge of the white "district chairmen" during the day, while at night the Negro "district chairmen" took over. All were responsible for giving quizzes, explaining the health exhibits and assisting with the showing of motion pictures.

A crowd estimated at 5,000 persons came by the "Corner" during the day and night and over 300 persons took the quiz. Radio broadcasts direct from the scene were made three times during the day with prominent civic and health officials taking part.

The Woman's Committee also sponsored and prepared weekly radio programs, planned and wrote newspaper articles, gave "Victory luncheons" and organized classes for the Red Cross in home nursing and nutrition.

In March the committee made a community survey which was designated "Know Your City Day," and which proved to be of tremendous importance to the program. Eighty members of the

committee, working in teams of two members each, spent one day with all the agencies and organizations in the town that they felt made any contribution whatsoever to the total health program. Some of the places and persons visited were: clinics at the health department, the hospitals, presidents of medical and dental societies, Red Cross, the city welfare department, schools, public library, city recreation department, headquarters of the Boy and Girl Scouts, housing projects, United Service Organizations, jails, courts, restaurants, milk plants, the water plant, county agent, the Home Demonstration Agent, Farm Security Administration, and others.

After the survey had been completed and the Woman's Committee began to analyze their data, they were amazed at their findings—and particularly was this true of prostitution and venereal disease. A meeting with all chairmen was called and the facts were reported to them. They decided that something should be done immediately to remedy the situation, and scheduled a mass meeting and invited all city and county officials to attend. The whole question of prostitution and venereal disease, as it existed in the community, was reviewed in the most objective manner possible by members of the Central Planning Committee, and officials were requested to clean up the town and county or admit their unwillingness or incompetence to do so, in which case help from the federal government would be sought. In less than a week's time eighteen road houses and tourist camps were raided and padlocked and heavy sentences were given to the offenders. The people had spoken!

In order that town and county officials may be given continual encouragement to enforce the law, the Woman's Committee has appointed a working committee of thirty-one teams of two members each. Each team has a number

which corresponds to a calendar day and when that day arrives is responsible for attending all sessions of the court and keeping a record of all the cases tried. Teams are also responsible for attending any open meetings of the following which fall on the day assigned to them: Board of Education, Board of Health, Recreation Board, Welfare Board, and City Aldermen. Reports from all teams are given at the regular monthly meeting of the Woman's Committee.

As an example of how the working committee functions—one morning a young prosecuting attorney was having considerable difficulty in establishing a case against a taxi driver, a procurer, and a madam when suddenly he received a note from the back of the courtroom informing him of a local ordinance of which he was unaware. He immediately shifted his approach and the three were given 18 months. The note had been written by one of the members of the "working team" who was also a member of a special committee appointed by the Woman's Organization to study local ordinances.

Soon after the first unit of the demonstration in community health education was started, a second was begun in an adjacent county, and since that time four others have been launched and are in various stages of development. In general, the organization of these programs has followed the pattern of the first, but because of individual differences, each town and county has designed its program to meet its own health needs. Additional health education consultants have been loaned to assist with the development of each of these units.

In four counties the program operates as a part of Civilian Defense and the district is the air zone and the neighborhood area, the sector, but otherwise the plan of organization is the same. Rural women in these counties are reached

through the neighborhood delineation groups of the Agricultural Extension Service.

One of the significant accomplishments of these community health education demonstrations has been their stimulation of professional workers in four counties to form coördinating councils or councils of social agencies which will not only advise lay groups about immediate problems but also work out long-range plans to provide for future needs.

There are many other highlights in the various programs, most of which have come about by adjustments to fit local needs. In one county, in addition to the regular organized study program, the Woman's Committee has provided assistance for all the prenatal clinics in six towns and has been responsible, as well, for the establishment of a public health clinic in a town where formerly such a clinic had been opposed. These women also organized four quiz corners and arranged for 22 Red Cross courses to be given in 8 communities. The prostitution problem was also given their attention and, working with the law enforcement officers, they were able to bring about considerable improvement in the area.

In another county the woman's organization known as the "Health and Defense League" has sponsored a Family Living Program and a Children's Day Camp in defense housing projects. They also held a series of health meetings at a Negro migratory labor camp and, as a result, several men and women went voluntarily to the camp nurse to get treated for syphilis. The same Health Defense League assisted the Selective Service registrants in filling out their questionnaires and were responsible for organizing a county nutrition council. Medical authorities at a large shipbuilding establishment are supplementing the Health Defense League's program by showing the venereal dis-

ease film "Know for Sure" to all persons seeking employment.

In the fourth area which was organized, the health education unit consists of two counties. In one of these the Woman's Health and Defense League conducted a rat campaign as one of its first activities. Negro leaders in this county have been particularly strong and have been able to carry a much larger share of the responsibility for program development than in any other area. The fact that the health department has taken such an active part in the community health education program has stimulated the department itself to develop in-service training and to plan a series of lessons for food handlers. In this county the health department and Woman's Health and Defense League plan jointly for two 15 minute radio broadcasts each week.

In the second county of this unit the woman's program began with a house-to-house fact-finding and immunization survey. The health officer, more than any other unit of the demonstration, has taken an active part both in the organization of the groups and in the program itself. In addition to this, lay leadership in this county has been very superior and, as a result, the program needs less actual supervision than in any other area.

The last unit which has been developed to date is in its initial stage of organization, and future plans call for the extension of similar programs in all of the war counties of the state.

Probably the most significant result of the demonstration from the standpoint of health education is the fact that the North Carolina State Board of Health has made provision for adding eight health educators to the local health departments in the war areas and has provided for the training of these workers through the facilities of the School of Public Health at the University of North Carolina.



Perhaps some specific mention should be made of the materials which were used in these programs, since the question of materials is always one of vital importance to the development of any community-wide program in health education. Where and how can one get them? Who will pay for them and what materials actually are available for groups with different intellectual endowments and educational and racial backgrounds?

While these questions still remain unsolved, the wide variety of materials which are being used have been secured from many sources such as: U. S. Public Health Service, state health departments, U. S. Department of Agriculture, National Dairy Council, Metropolitan Life Insurance Company, and state universities. When the programs began, only three of the health departments in the demonstration area owned motion picture machines and their film library consisted of two films. Each department had pamphlets on many subjects, but they were not available in the quantity needed for county-wide study programs. Nor was there any money in any of the budgets for health education. Therefore, arrangements had to be made to secure materials elsewhere.

An interesting sideline which developed from the community health education demonstration during the summer was a malaria education project sponsored by the U. S. Public Health Service in seven southern states. In North Carolina nine teachers carried on intensive malaria education programs in seven counties, six of which were in the counties just described.

In two counties during the first 7 months of the demonstration, 328 meetings were held, with a total attendance of 40,984 persons. Motion pictures on various phases of health were shown 398 times and 74,990 pamphlets were distributed. Conferences on the program numbered 538. Thirty radio broadcasts

were given and over 75 articles about the program appeared in local newspapers. These figures do not include persons who did not attend the meetings but were reached by the "block" chairmen; neither do they include the Red Cross home nursing and nutrition classes which were organized as a part of the program, nor the home demonstration adult groups which used health materials loaned to them by the Woman's Committee. These figures are included in this description of the programs not because such statistics are at all a true index of health education, but so that some objective measure of the extent of community service may enter into the broader evaluation.

The figures that are really important are people—people who have found out for the first time that there are many problems in a community, problems that are all related and worthy of the consideration of every good citizen. Then, too, there are the *people* who admit that they have blocked other programs for years simply because they didn't know the facts; and there are those "southern ladies" who wouldn't mention words like "syphilis" and "gonorrhea" last September, but who only a few weeks ago were willing to spend hours in a venereal disease clinic learning the facts about the diseases and how they are handled by a health department.

There are the Negroes who, on a cold winter night or after a hard day's work, walked miles to see a health film and a few days later walked more miles to get a blood test. There is the school teacher who, after he saw a film on tuberculosis, went in for a chest examination and found that he had an active case of the disease. And the woman who knew she had a sore that needed attention but was afraid to find out the truth—until she saw a cancer film.

There are the women in mill towns who made house-to-house canvasses to urge mothers to take their

children to clinics to be immunized. These are the same women who came directly from the cotton mill looms with lint on their clothes to learn about health and take classes in home nursing so that they could do a better job in taking care of their children. And there are those people who have always thought that health departments were organizations to take care of the poor, mostly poor Negroes; but now know and appreciate the work being done. And the people who for the first time recognize that there is leadership at the "bottom of the hill" as well as at the top, and that everybody has a part to play in a true community program. And last, there are the staff members who were perfectly willing to devote several

nights a week to teaching health classes or to showing health films.

There are many other things that people have said or done that can never be told, but are true evaluations, nevertheless.

It has been well said that, "Doing things for people is often easy, but it is often expensive and of temporary benefit; showing people how to do things for themselves may take a little more time, but it is relatively inexpensive and its results are lasting."

Today more than ever before, health education has the opportunity to awaken in each individual a sense of responsibility which will enable him to assist in developing a community dedicated to human welfare.

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## Tetanus in Drug Addicts

During recent years the spread of malaria among drug addicts is quite common and its epidemiology well understood, a common syringe, and intravenous injections, sufficing to carry malaria parasites to a new host.

Sporadic cases of tetanus in drug addicts are not uncommon, and have usually been ascribed to wound infection through carelessness. The following outbreak, however, admits of no such explanation.

A group of 9 cases of tetanus in Negro drug addicts (8 fatal) was reported during December and January. The victims were all friends living within a few blocks of one another and pooling their resources to obtain heroin. Following this use of a common supply all developed symptoms of tetanus after varying intervals and were admitted to

a hospital where, with one exception, they died. Investigation showed that the heroin solution was prepared by placing the drug in water in a spoon and then warming sufficiently to dissolve. The use of a common syringe was denied, but each addict drew his allotted dose from the spoon. It is evident that the drug was contaminated with tetanus, although none of the material was available for examination.

Since this outbreak among Negro drug addicts, 3 additional cases of tetanus in white addicts have occurred. So far they cannot be linked to the Negro cases. It is possible that a substantial supply of narcotics coming from illicit sources may be contaminated with tetanus spores.—*Quart. Bull., City of New York Health Dept., Aug., 1942.*

# Pulmonary Tuberculosis Resulting from Extra-Familial Contacts\*

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IN recent years, numerous epidemiological studies have shown that tuberculosis not infrequently occurs in several members of a family. The disease may attack as many as four generations. The frequency with which multiple cases have occurred within a given household has tended to obscure the importance of contacts outside the immediate household.

In mass surveys there is not the opportunity for individualization of cases that is necessary to discover extra-familial sources of infection. Rural communities with low death rates from pulmonary tuberculosis have afforded excellent opportunities for demonstrating the importance of extra-familial contact in the spread of tuberculosis in the community. Downes has shown that extra-familial contact has played an important part in the spread of tuberculosis in a rural community.<sup>1</sup>

The Massachusetts Department of Public Health recently conducted a 5-year survey on the control of tuberculosis in Berkshire County in Western Massachusetts. This county was considered to be representative of a rural community in New England and has next to the lowest death rate from

pulmonary tuberculosis of any county in the state. It was during these studies that our attention was focused on the importance of extra-familial contact in the spread of tuberculosis in the community. Figure 1 is a graphic representation of the spread of tuberculosis among several families as a result of extra-familial contact. The solution of this situation required a considerable period of time and a careful evaluation of certain obscuring factors. For this reason, the circumstances and clinical facts will be described in some detail.

In March, 1935, and August, 1936, two cases of pulmonary tuberculosis were reported in a small community of approximately 4,000 persons. Both cases were high school girls, aged 18 and 16 respectively. They were the only young persons in their respective homes. Members of family "A" were examined and were found to have no evidence of tuberculosis. Family "B" refused examination at the time but were examined subsequently and found to be entirely negative for tuberculosis. There was no history of tuberculosis in either of the families as far back as they could recall. Both households used raw milk from tuberculin tested herds. The milk supply was obtained from different dairies. The two girls were not "chums" but did attend the same high school.

\* Read before the Epidemiology Section of the American Public Health Association at the Seventy-first Annual Meeting in St. Louis, Mo., October 23, 1942.

EXTRA-FAMILIAL SPREAD OF TUBERCULOSIS IN A RURAL COMMUNITY

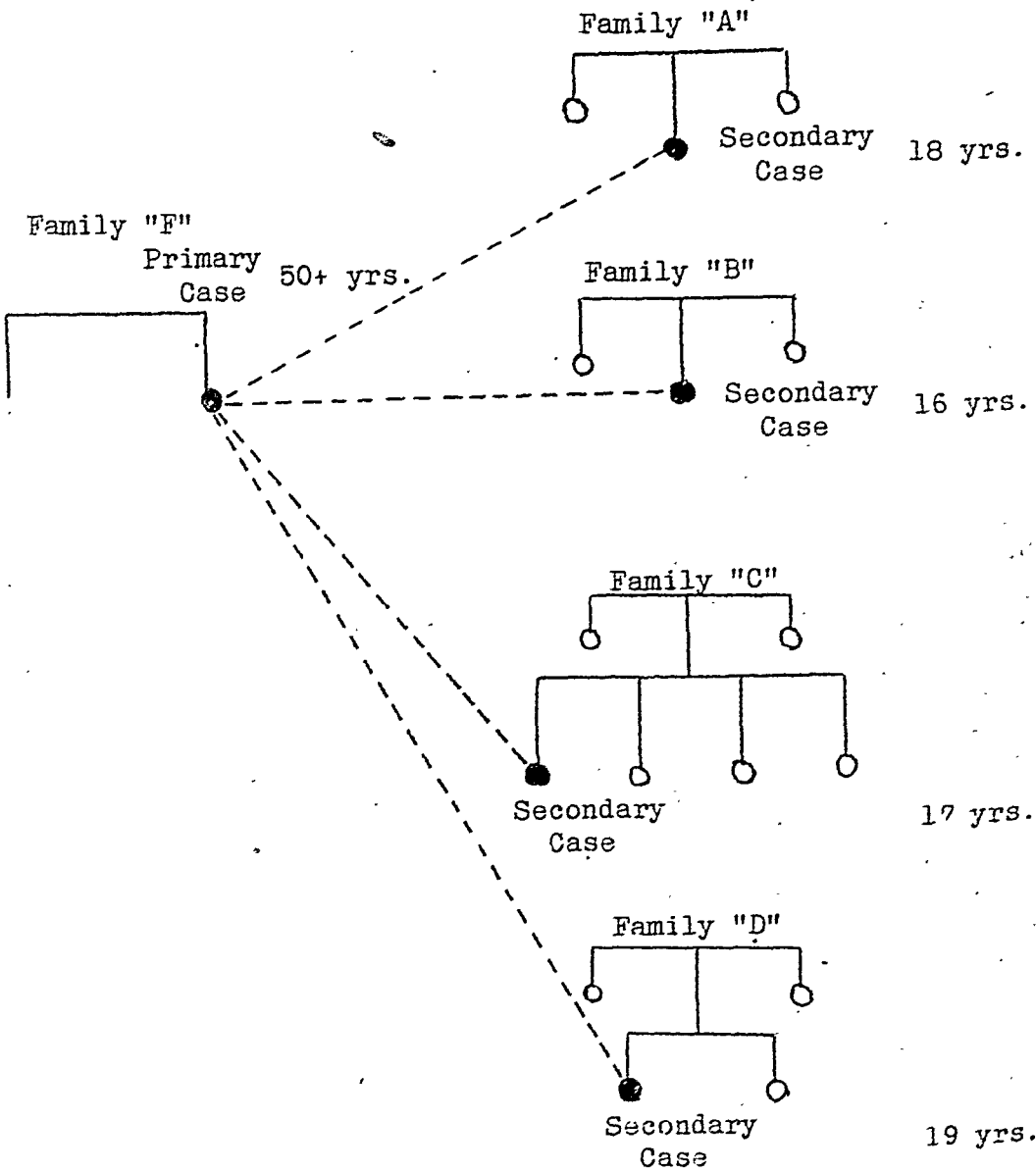


FIGURE 1  
PROTOCOL

	Date of Onset Approx.	Age of Onset (Years)	Present Status of Case	Year H. S.	Sputum	Family	Choir
C. K.	March, 1935	18	Dead	1934-1935	Positive	"A"	1934-35
M. W.	August, 1936	16	Arrested	1934-1936	Negative	"B"	1935-36
S. W.	April, 1937	17	In San.	1933-1937	Positive	"C"	1935-36-37
M. H.	December, 1937	19	Dead	1933-1937	Positive	"D"	1934-37
Mrs. D.	Unknown	50+	In San.	-	Positive	"F"	1933-36

A check with the school physician gave all of the teachers a clean bill of health, with the possible exception of

one. The latter had suffered from pulmonary tuberculosis two years prior, but was discharged from the sanatorium

as an arrested case. Further investigations in the community caused some doubt in the mind of the investigator regarding the teacher's physical condition, because several of the pupils complained to their parents that this teacher coughed during her classes.

The school physician made several sputum examinations, all of which were negative for tubercle bacilli. The charge that the teacher was a source of infection for the two girls did not seem justifiable in view of the repeated negative sputum reports and her denial of symptoms. Certainly the burden of proof was upon the person who said there was a causal relationship between the new cases and the teacher.

The situation rested at this stage until April, 1937, when the investigator was requested to see a patient in consultation. The patient was found to have pulmonary tuberculosis. She was a 19-year old girl who had been graduated from the same high school in 1936. Careful inquiry revealed that she had had little or no contact with either of the other girls at school. She had, however, during the time she was in school taken two courses given by the teacher who was under suspicion. A check-up by x-ray in her family revealed no evidence of active tuberculosis in any of the members, nor was there any family history of the disease. Again the evidence pointed to someone in the high school as a potential source of infection for these three girls. The teacher, aware that she was under suspicion and being somewhat embarrassed by the persistent questioning by the school physician, returned to the sanatorium outside the state for a check-up where she had formerly received treatment. A negative report was received by the school physician from the sanatorium.

Thus the situation remained until December, 1937, when a second request for consultation was received. This

time the patient was another high school girl aged 17. She had pulmonary tuberculosis. She, too, had had the same teacher in some of her classes. She knew all three of the girls but denied close friendship with them. Her family was examined by x-ray by a local physician who reported negative findings. Subsequent examination of these films confirmed the original report. At this stage there seemed to be almost overwhelming evidence that these girls had had a common source of infection, and the logical place to search seemed to be in the high school.

Further revisits were made to the families for the purpose of rechecking their contact histories. All families had used raw milk from tuberculin tested herds, but only two of the families took milk from the same dairy. It was during one of the visits to family "C" that a casual remark was made relative to a certain church which opened a new approach to the problem because it was known that family "A" attended the same church. Visits were made to families "B" and "D" and it was discovered that both of them also attended this church.

This was a remarkable coincidence. A rough statistical calculation placed the church under strong suspicion on the basis that in the school population considerably less than one-half of one case would be expected to have occurred by chance among this religious denomination if the source of infection were in the school. Thus attention was directed away from the high school. Inquiries were made regarding attendance of these girls at the church, which revealed that three of them sang in the choir and that all four of them had attended social functions at the church on numerous occasions.

A careful check-up of the reported cases and deaths in the community failed to show any of them to be members of this church.

During the investigations relative to the church membership it was learned quite by accident that the wife of the former minister in this parish had developed pulmonary tuberculosis and had entered a sanatorium in another state within 3 months after leaving this parish, early in 1936. This rumor was checked and found to be authentic. In fact, at the time of her admission to the sanatorium her pulmonary condition was advanced and her sputum was markedly positive. Further inquiry revealed that the minister's wife also sang soprano in the choir and took communion from a common cup before three of the girls who sang in the choir, as well as before the fourth who was not a choir member. Thus a common source of infection was found for these four girls in their fellow church member. On the basis of x-ray, sputum examination, and statistics, the school teacher, an arrested case, was eliminated from suspicion.

#### DISCUSSION

Aside from determining the true source of infection for these four girls, several other factors of epidemiological significance in the spread of tuberculosis in a community are manifested. It is well known that the commonest age at which death from tuberculosis in women occurs is between the ages of 20 and 25. There is also evidence at the present time to show that the age of highest mortality from tuberculosis is gradually shifting to the older age groups.<sup>2</sup> In this particular instance the range in age was from 16 to 19 years. All cases were girls, again revealing the importance of sex. We have in their age and sex two factors which have to be considered as contributing toward their susceptibility to pulmonary tuberculosis. A further factor of im-

portance so far as the spread of disease in a community is concerned is that three of these girls had positive sputum at the time the diagnosis was made. Two of them were moderately advanced and two were far advanced at the time of diagnosis. There was a high fatality rate. Two of the girls have already died from the disease, while one remains in a sanatorium, and the fourth has been discharged from a sanatorium as an arrested case.

Although three of these girls sang in the soprano section of the choir, while the fourth did not, there was ample opportunity for contact between the fourth girl and the tuberculous wife of the minister through social functions and the Sunday School. It was ascertained that these contacts were regular, usually once or twice a week, over a period of several years. The question of the use of the common communion cup is a "moot" one. It is reasonable to suppose that droplet infection through the contact at choir practice and social functions might well be sufficient to result in active disease in susceptible individuals such as girls of this age group.

The dosage of infection was probably fairly large if consideration is given to the cumulative effect resulting from frequent exposures at fairly regular intervals.

#### CONCLUSION

Failure to find a source of infection within a household should not preclude further attempts at finding the source case.

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# New York State Mutual Aid Plan for Water Service

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THE world conflict has brought new problems to the United States. Never before have we considered our cities to be subject to bombing by an enemy force. The attack at Pearl Harbor shocked the country into sudden realization that what has happened in Europe during the past three years can happen here. We have become conscious of the fact that the wide expanse of the Atlantic and Pacific Oceans can no longer guarantee us safety from the aggressors.

It became necessary, therefore, to develop new plans for the protection of our civilian population. An important result is the plan for the protection of our public water supply systems and insurance of their prompt restoration in case of damage resulting from attack by the enemy. New York was one of the first states to inaugurate a Mutual Aid Plan for Water Service as an agency of the State War Council. Many other states throughout the country have patterned similar plans after it.

At the request of Governor Herbert H. Lehman, the New York State Department of Health and the Conference of Mayors appointed a committee of water works experts to formulate the Mutual Aid Plan for Water Service. Under the plan which was placed in operation in October, 1941, the state is divided into 22 zones which are coterminous with the boundaries of the existing state health districts, except for the separate

zones comprising Westchester, Nassau, and Suffolk Counties. An outstanding water works official has been appointed as zone coördinator in each zone and the district engineers of the State Department of Health and the county sanitary engineers of Westchester, Nassau, and Suffolk Counties hold appointments as assistant zone coördinators.

## AUTHORITY

At the regular session of the 1942 New York State Legislature two bills were passed which relate to the Mutual Aid Plan and provide needed authority for carrying out its objectives. One law, constituting Chapter 544, set up a State War Council with wide, sweeping powers, and established a state office of civilian protection under the jurisdiction of the State War Council. The other law, constituting Chapter 574, provided for carrying out other specific objectives of the Mutual Aid Plan.

## THE OBJECTIVES OF THE PLAN

### A. *In the Field of General Preparations:*

1. The interconnection of public water supply systems.
2. The interconnection of public water supply systems with *approved* industrial or other water supply systems.
3. The preparation and maintenance of accurate maps of distributing systems or revision of existing maps to an up-to-date status.
4. The preparation and maintenance

of accurate records (books or otherwise) of the location of valves and other vital parts of the system.

5. The frequent testing of valves and fire hydrants to insure that these are in proper working condition at all times.

6. Collaboration with local fire officials in regard to—

a. Surveys and preparation for use of all possible emergency sources of water supply which may require pumping into the system during an emergency.

b. The characteristics of valves and fire hydrants and the needs for hydrant adapters.

c. Surveys of distribution systems to discover defects and weaknesses, and the development of plans for their correction, together with reinforcement of systems to the maximum degree possible.

7. Collaboration with local power and other utility officials in regard to conditions that may affect operation of the water supply in an emergency, and the measures to be taken to insure ability of the water system to function in event of the failure of other utility services.

8. Collaboration with local fire and war industry officials in regard to deficiencies in water service and fire protection furnished to war industries and coöperation in correcting such deficiencies.

9. The thorough study and consideration of the needs for protection against possible water works sabotage or fifth column attacks, and the adoption of such measures as are reasonable and consistent with the needs of each particular community.

10. The preparation of a detailed inventory of water works personnel, equipment, materials and supplies, and the submission of such data to the Zone Water Supply Coördinator.

*B. In the Field of Civilian Protection:*

1. Collaboration with local war coun-

cils and local directors for the purpose of integrating the civilian protection features of the Mutual Aid Plan with the plans of local councils and local directors.

2. Technical advisory assistance on all matters related to water supply to the State Director of Civilian Protection, his deputy directors and assistants, local war councils, and local directors.

3. The organization, training, equipment, and operation of water main emergency repair crews and other auxiliary or reserve water works personnel, to function through the local water superintendent under the local director.

PLAN OF ORGANIZATION

The Governor appointed the writer as State Water Supply Coördinator with A. F. Dappert, Principal Sanitary Engineer, State Health Department, as Assistant Coördinator, to direct the carrying out of the specific objectives of the Mutual Aid Plan. The writer was also appointed Director of a Division of Water Main Emergency Repairs under the State Office of Civilian Protection of the New York State War Council, to act as technical adviser to the State Director of Civilian Protection and as directing head of the plan on all matters relating to the organization, training, equipment, and operation of emergency repair crews and other auxiliary or repair water works personnel and other matters relating to the integration of the civilian protection features of the Mutual Aid Plan with the plans of local directors of civilian protection. The work of supervision and direction is decentralized throughout the state through the offices of the zone and assistant zone coördinators in the respective areas under their supervision.

A manual for the instruction, information, and guidance of local health, water, sewer, and milk officials, and chair-



men of local war councils and directors of civilian protection has been prepared. This manual describes not only the specific plans and preparatory steps which should be taken in advance of any emergency but also the detailed emergency organization which should be developed as a part of the civilian protection services which are necessary to maintain efficiently or permit restoration of these vital services. The manual also gives technical advice for the guidance of local authorities in meeting special problems involved in the preparation for and handling of serious emergencies and the procedures on which these vital services are integrated with the civilian protection plans of each community.

As a supplement to this manual of emergency sanitation services, a bulletin has been prepared designed to serve as a guide to the local directors of civilian protection and local water officials in the organization, development, and training of auxiliary or volunteer emergency water main repair crews and other auxiliary personnel assigned to emergency water service duty. This bulletin gives a detailed outline of the qualifications required for the volunteer personnel assigned to emergency water service duty and the extent of need for such personnel. Details of training courses for the proposed repair crews and instruction methods are also outlined. The latter program has been worked out in coöperation with the Bureau of Public Service Training of the State Department of Education and Municipal Training Institute of the New York State Conference of Mayors and Other Municipal Officials.<sup>1</sup>

Five 3 day regional water service training schools were held throughout the state during July for the purpose of training and instructing the key municipal water works personnel in order that they may in turn be better prepared to act as instructors to the large number

of volunteer and civilian emergency repair crews to be organized by the Office of Civilian Mobilization.

The Bureau of Public Service Training of the State Education Department and the Municipal Training Institute of the New York State Conference of Mayors have given the services of their organizations and officers in conducting these schools. Similarly, the New York State Section, American Water Works Association, has offered assistance. These offers are greatly appreciated and have been gratefully accepted. In fact, without such assistance it would be practically impossible to assume the responsibilities required to carry out and hold these training schools.

#### ACCOMPLISHMENTS TO DATE

Some of the accomplishments of the program to date may be briefly summarized as follows:

1. Of a total of 286 proposed interconnections between water systems, some 210 have been installed. These are needed wherever possible so that, in event of failure of one supply, full or partial water service may be maintained by drawing upon the other.
2. 388 communities have submitted maps of water supply distributing systems. These records should be available at all central cities in the event of any emergency.
3. 398 communities have made surveys of possible emergency water supplies. The availability of such emergency sources of water supply may be extremely vital in case of any disruption or failure of the regular source of supply.
4. 230 communities have made surveys of their water distribution systems for weaknesses. The importance of correcting any deficiencies or weakness needs no emphasis.
5. 64 communities have made special studies of water service and fire protection to defense industries.
6. 41 communities have made special studies in coöperation with power officials.
7. 79 communities have already undertaken the organization and training of auxiliary water works personnel.
8. 179 communities have given special attention to protection against possible water works sabotage.
9. 688 communities have submitted inven-

ories of water works equipment, materials, supplies, and personnel.

There is no feature of the program that is of more importance today to our municipal authorities and water works officials than the mutual aid inventory of water works material, in view of the ever increasing difficulty of obtaining critical materials which may be needed on short notice in case of emergency. The availability of this information in ready reference form makes it possible to arrange promptly for the loan of needed material and equipment. In respect to this feature of the Mutual Aid Plan for Water Service, it can be stated that it is now substantially complete and in effective operation.

In this connection, the State Coördinator, with the coöperation of a specially appointed War Inventory Committee of the New York State Section, American Water Works Association, is making a survey with a view to establishing a central pool of information on available water works material. This inventory plan is being undertaken to coöperate with the War Production Board, the Office of Civilian Defense, and the Army and Navy authorities. It is a direct result of the War Production Board's order to the water works authorities of the cities of the country having populations of 50,000 and over to curtail their inventories to the December 31, 1940, level.

#### IMMEDIATE PROBLEMS FOR THE FUTURE

For the next few months it is the purpose of the State-wide Mutual Aid Plan for Water Service to concentrate efforts in the direction of integrating the local water departments with the civilian protection services of each community and to secure the organization and training of water main repair crews and other water works auxiliaries who will be urgently needed in event of actual emergency.

Another important task is that of arranging to have a responsible local water official represented at the Office of the Local Director of Civilian Defense with a complete and accurate record of the water works system available. This official must assume the responsibility of arranging for such representation and for prompt attendance at practice black-out trials in order that each water works employee and organized auxiliary will be available and ready for emergencies.

The importance of having the fire departments coöperate with the water departments has been emphasized from the very beginning of our program in New York State. It has been pointed out that the fire departments have been accustomed to depend upon the availability of public water systems for the required water to fight fires, and have ordinarily given little thought to the necessity of emergency supplies. Unless there is complete coöperation and exchange of information between the fire and water departments, so that the fire departments know where the emergency supplies are and how to use them, the water departments have wasted their time in arranging for such supplies.

It must be remembered that the Army authorities hold the water works superintendent in each municipality responsible for an uninterrupted supply of water for the continued operation of defense industries. In the event of bombing it is certain that public water and sewer systems will be damaged. It is essential, therefore, that the public works departments and water departments coöperate plans through civilian protection directors for the necessary equipment and personnel for making such repairs.

While the Mutual Aid Plan is a product of the war, experience in New York State in the few months that this plan has been in operation has shown that it will be of value even in peace

time. One wonders why the plan has not previously been considered. It certainly seems to be indicated that the plan with all of its benefits to the water

works of the country will be continued long after the present war.

## REFERENCE

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## Mental Hygiene Service in a Rural Area

*New York State Health News* for October 5 reports on the Suffolk County, New York, mental hygiene program, which has now been in operation more than one year and which, according to *Health News*, has already demonstrated the advantages of a type of rural health activity in promoting the broader aspects of public health service.

According to *Health News*, the Suffolk County Mental Hygiene Division is believed to be the first in the United States organized within a county department of health. It began to function April 1, 1941. Its objectives are to ascertain local mental health problems and to devise constructive ways of meeting them. The staff consists of the Director, George M. Lott, M.D., who is a psychiatrist, and one psychologist, two psychiatric social workers, and a secretary. The mental hygiene clinics

of the state mental hospitals conducted in the county continue to serve their own parole patients and community cases in their areas. The county health department mental hygiene unit is responsible for all juvenile court cases, and provides needed services to schools in outlying rural districts. The first year's service has included 250 cases, and about 500 children have been surveyed by group-testing methods. Of the school children tested, 11.5 per cent had learning disabilities, 14.5 per cent were found to be mentally deficient, and 6 per cent were neurotic. Major physical defects appeared in 5 per cent, while 33 per cent presented behavior and social problems.

Suffolk County's experience shows that the organization of a mental hygiene unit within the county department of health offers many advantages.

# False Positive Phosphatase Test from a Thermophil in Pasteurized Milk

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IN 1937 the Baltimore City Health Department adopted the Gilcreas<sup>1</sup> modification of the Kay and Graham<sup>2</sup> phosphatase test. Since then a total of twenty-one false positive tests have been obtained from pasteurized milk and cream from dairy plants where the equipment and the pasteurizing procedures were found upon careful inspection to have been operated properly. Interest in these positive tests developed as the number increased and no satisfactory explanation for them could be given. Leahy and others have shown that certain strains of bacteria are capable of hydrolyzing the substrate used in the phosphatase test.<sup>3,2</sup> Accordingly, these investigators have emphasized the need for caution in interpreting the results of phosphatase tests where excessive numbers of bacteria are present. Suitable control procedures for recognizing these "false positive tests" have been in use in this laboratory for several years past.\*

A positive phosphatase test was obtained from bottled pasteurized milk produced by a certain dairy under supervision in November, 1941. The phosphatase reading of 0.12 mg. phenol per 0.5 ml. of milk was observed and the test remained positive after re-pasteurization in the laboratory.

The bacterial plate count was significantly low from 1 ml. of this milk incubated at 37° C. for 48 hours. How-

ever, the direct microscopic count gave approximately 15 million bacilli per ml. The organism observed showed a marked resemblance to *Lactobacillus thermophilus*. These findings suggested a thermophilic organism as the possible cause of the positive phosphatase test; and the problems presented seemed to warrant investigation.

The primary purpose of this investigation was to isolate the organism and study the morphological and biochemical characteristics. This work is reported below under the heading "Experimental." Attempts to ascertain if such a bacterium could produce a phosphatase enzyme in milk in a given day, during the pasteurization procedures, are reported subsequently in this paper under the heading "Bacterial Phosphatase."

## EXPERIMENTAL

### *Isolation of the Suspected Thermophil*

To ascertain if the suspected thermophilic bacillus was present in all pasteurized milk produced by a certain dairy and if it was in sufficient numbers to produce a positive phosphatase test, samples were requested from the beginning and the end of the pasteurizing process. These samples were divided into equal portions and were examined as received for total bacterial counts by the direct microscopic and plate methods. The two other portions were incubated at 52° C. for 19 hours and

\* Unpublished data.

TABLE 1

*Bacterial Counts and Phosphatase Results from Bottled Pasteurized Milk*

<i>Samples</i>	<i>Direct Count per ml. of Milk</i>	<i>Plate Count per ml. at 37° C. Incubation for 48 Hours</i>	<i>Phosphatase Test *</i>
1. First of Run	>30,000	3,000	0.015—Negative
2. End of Run	2,400,000	420,000	0.015—Negative
			0.015—Control
<i>The Same Milk Held at 52° C. for 19 Hours</i>			
3. First of Run	48,000,000	5,700	0.065—Positive
4. End of Run	60,000,000	640,000	0.14 —Positive
			0.015—Control

\* Mg. of phenol per 0.5 ml. of milk, Gilcreas modification

then examined as previously stated. All four portions were subjected to the phosphatase test. The results of these examinations are given in Table 1.

As indicated by the data in Table 1, the milk sample from the first of the run with low bacterial counts and a negative phosphatase test may be considered as normal milk. The sample from the end of the run shows marked increases in the direct microscopic and plate counts, with no change in the phosphatase test. Both samples, however, when incubated at 52° C. for 19 hours gave marked increases in the direct microscopic but not in the plate counts, and produced positive phosphatase tests, indicating that a thermophilic bacillus might be the agent responsible for the change.

To obtain the suspected thermophil in pure culture, it was decided to grow the organism in tryptone broth (T.B.), as suggested by Ayers and Johnson,<sup>4</sup> for promoting the growth of *Lactobacillus thermophilus*. Tryptone agar was to be used for plating, and dilutions made with the T.B. so that large, well isolated colonies would be obtained. Three predominating, well isolated colonies were to be picked and transferred to tryptone broth and back to agar. Each set of the broth tubes and plates were to be incubated at the following temperatures, 37° C., 44° C., 52° C., and observed at 24 and 48

hours. This procedure was to be performed at least ten times before the organism would be considered in pure culture.

Good growth and large colonies were obtained from the broth and agar cultures respectively in 24 hours when incubated at 44° C. and 52° C. No growth was observed from those held at 37° C. The broth cultures were quite turbid in 24 hours and showed a marked sediment in 48 hours at 44° C. and 52° C. Two kinds of colonies were observed on all plates. Each kind when picked to broth and back to agar produced both kinds of colonies.

After at least ten transfers it was decided to try several media to observe colony formation. They were: (1) Old standard nutrient agar (O.S.N.A.), 1934 formula American Public Health Association<sup>5</sup>; (2) New standard nutrient agar (N.S.N.A.), 1939 formula American Public Health Association<sup>6</sup>; and (3) American Association of Medical Milk Commission's agar (A.A.M.M.C.A.).<sup>7</sup> All platings were incubated at 44° C. for 24 hours and observed by the Buck Colony Counter.<sup>8</sup>

The O.S.N.A. gave two kinds of colonies which may be classed as the pin point type. Colonies from the N.S.N.A. and A.A.M.M.C.A. were from 3 to 5 mm. in diameter, with both kinds present, the latter agar giving slightly larger colonies. These colonies will be

described presently, including a third kind under cultivation. A total of 20 transfers were now completed, the thermophilic bacillus was considered in pure culture and the morphological characteristics were therefore studied.

### *Morphology*

The organism was found to be rod shaped, at least during the greater part of its active life. It was of relatively large size, the smallest bacillary element measuring about 1  $\mu$  in length, and the longest about 6  $\mu$ . The diameter of the bacillus was approximately 0.4  $\mu$ . Long filaments of chain formation extending beyond the microscopic field may be formed. Such long chains were never observed in commercial pasteurized milk. The agitation during the pasteurizing process in all probability would break them up into groups of a few cells (Fig. 1, Plate A). They were observed from buffered tryptone dextrose broth and agar cultures (Fig. 2, Plate A). Certain cultures, especially those from O.S.N.A. slants 48 hours old and older, showed a high degree of pleomorphism. The organism produced bizarre or involution forms that range from coccobacilli to large club shaped or pyriform bodies. The swellings occurred terminally and sub-terminally and varied in size (Fig. 3, Plate A). At first the organism was thought to be a spore-forming bacillus, but smears made from agar slants, stained for spores and examined each day for 10 days, did not reveal any conclusive evidence of spore formation. No viable transfers were obtained after 72 hours' incubation at 44° C. Cultures subjected to 85° C. for 5 minutes could not be recovered when reinoculated into broth or agar slants. Cultivation on potato also failed to reveal spores. Observations for motility were made by the usual hanging drop method, except that the B.T.D.B. culture was maintained between 45 and 48° C. while

under observation. It was found to be non-motile. From very young broth cultures, 1½ hours old, the organism was found to be Gram-positive. Agar cultures 4 hours old or older were Gram-negative. Observations of very young cultures, 1½ to 3 hours old, in dark field, presented few pyriform types. Older cultures on less favorable medium showed many of these forms. They also contained many granules which suggested gonidia-like structures (Fig. 4, (c), Plate A).

### *Staining Reactions*

The bacillus stains well with many of the ordinary dyes and procedures when the culture is not over 72 hours old. Older cultures do not take the dye so well and many organisms are seen only in outline form. They present a ghost-like appearance. Often after a culture is 48 hours old transfers fail to grow. This suggests a degeneration of the cells and may explain the poorly stained smears.

### *Cultivation*

Observations of colony formation by the shake tube method revealed that larger colonies formed near the surface of the medium. Colonies became progressively smaller in the deeper layers of the agar. The bacillus may therefore be considered a facultative anaerobe but grows best aerobically.

As previously stated, three types of colonies were produced on agar. The largest colonies observed were obtained on a recently devised medium. It is buffered tryptone dextrose agar (B.T.D.A.).\* Type A is a convex, raised, erose, translucent colony of approximately 1 to 2 mm. in diameter. Type B

\* The B.T.D.A. formula is as follows: Agar 1.3 per cent (BBL.); Bacto-tryptone 1.0 per cent; potassium phosphate ( $K_2HPO_4$ ) Baker's 0.1 per cent; dextrose 0.05 per cent; in distilled water. Sterilize twice, in autoclave with not over 5 lbs. pressure each day for 20 minutes or Arnoldize. Final pH 7.2 to 7.4. (Baltimore Biological Laboratories = BBL.)

## PLATE A.

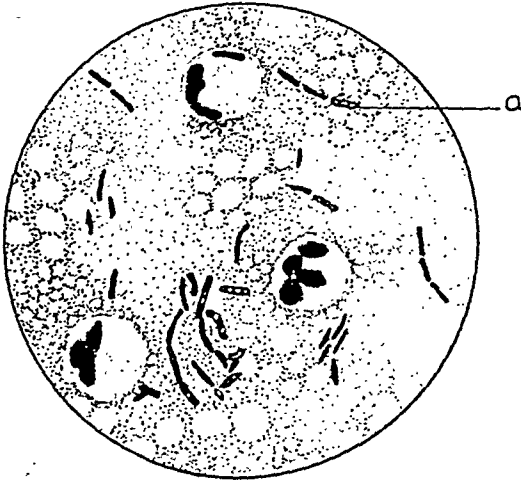


FIG. 1:

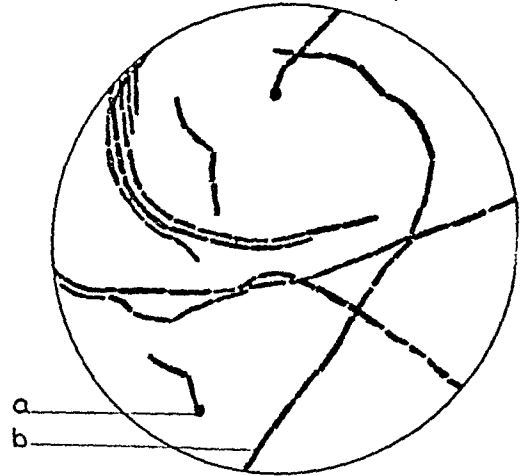


FIG. 2.

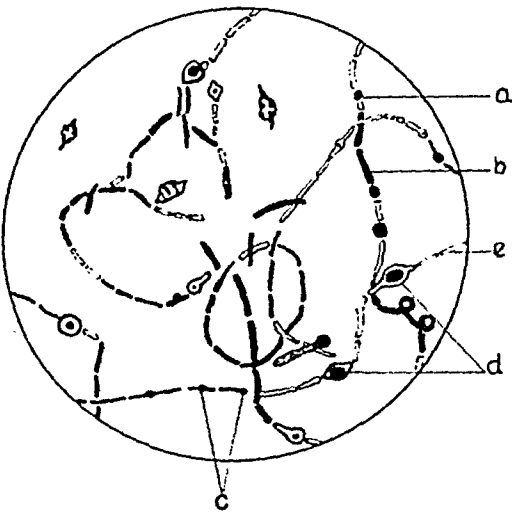


FIG. 3.

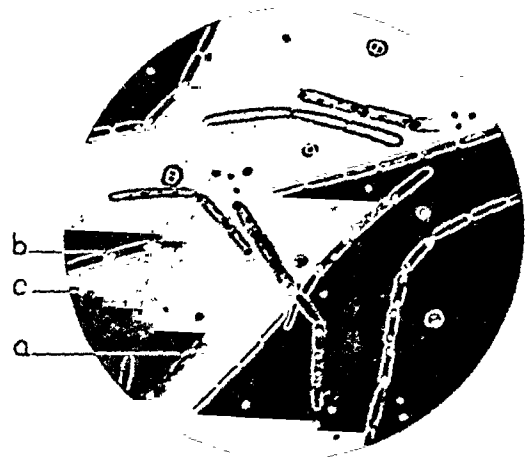


FIG. 4.

Camera Lucida drawings x 1350

is a very thin, transparent colony, ciliated, and under certain lighting gives a pale blue hue. This colony is approximately 3 to 5 mm. in diameter and is usually observed in the deeper layers of agar. Type C, a surface colony, is similar in all respects to Type A except that it is usually larger, approximately 4 to 6 mm. in diameter, not

including the radial arms which may extend 1 cm. or more, depending upon the incubation period. On B.T.D.A. slants the growth is rhizoid, transparent, and somewhat difficult to observe with the naked eye, especially young cultures.

Broth cultures (B.T.D.B.)\* are tur-

\* Formulae for B.T.D.A. and B.T.D.B. are given in the text.

bid, with some settling after 24 hours. Type C colony in broth often produces a filamentous growth similar to a tangled piece of string. This growth is often observed within a 2 hour period. On blood agar no hemolysis of the red blood cells occurs.

### *Temperature Relations*

To ascertain the temperature for optimum growth it was decided to obtain the organism in as viable a stage as possible; then to submit culture transfers to the following temperatures, 37°, 44°, 48°, 52°, 60° and 62.5° C., and observe them hourly for visible growth, with the exception of the overnight period.

Rapid transfers were made by inoculating B.T.D.B. twice a day, at 9 A.M. and 5 P.M., for two days from cultures incubated at 44° C. Eighteen transfers to B.T.D.B. were made. Three transfers were then incubated at the previously stated temperatures. Observations for growth were made hourly by comparing the inoculated tube with an uninoculated control.

No growth was observed in 24 hours from the 3 transfers incubated at 37° C. Growth was observed within 2 hours in 5 of the 6 transfers incubated at 44° and 48° C. All 3 transfers submitted to 52° C. showed growth in 3 hours. Also those submitted to 60° and 62.5° C. However, the turbidity noted in these tubes incubated at the two latter temperatures were not as heavy. The temperature for optimum growth may be tentatively placed at about 52° C.

### *Thermal Death Point*

The thermal death point was determined by the Chick <sup>8</sup> method, except that the 18 hour B.T.D.B. cultures were diluted in 10 ml. of broth so that direct

counts of approximately 1 million organisms per ml. were obtained for each series of three thin wall tubes to be submitted to the following temperatures: 64°, 64.5°, 65°, and 66.1° C. The suspensions were well agitated and samples taken every 5 minutes during the 1 hour exposure to heat. The temperature variation was  $\pm 0.2^\circ$  C. When three 1 ml. portions of exposed culture were withdrawn and inoculated into B.T.D.B., incubated at 44° C. for 24 hours and failed to produce growth in 3 of the 3 portions, the culture was considered killed. The results are shown in Figure 1.

From the data presented in Figure 1, it may be seen that temperatures of 64° C. for 48 minutes, 65° C. for 30 minutes, and 66.1° C. for 18 minutes apparently destroyed the organism.

### *Resistance to Chlorine*

Four trials to determine the resistance to chlorine were made with water washings from 24 hour cultures grown on B.T.D.A. The water suspension contained approximately 1 million organisms per ml. The concentration of chlorine was determined before and after adding the organisms, and found to be relatively unchanged. To 9 ml. of 1 p.p.m. of chlorine, 1 ml. of the organism suspension was added and exposed for 1 minute. Five 1 ml. portions were transferred to B.T.D.B. and incubated at 44° C. for 24 hours.

No growth was obtained from 20 such transfers and it was concluded that chlorine in a concentration as low as 1 p.p.m. was effective in destroying the thermophilic organism in 1 minute.

### *Maintenance*

The organism may be satisfactorily maintained by transferring every 24 or 48 hours into B.T.D.B. or skim milk. The Cryochem process <sup>9</sup> used with skim milk has maintained the organism for over 30 days.

<sup>8</sup> *The Theory of Disinfection. A System of Bacteriology.* Medical Research Council, London, 1:173, 1930.



### *Biochemical Reactions*

The fermentative reactions were studied in a basal medium containing Bacto peptone 1 per cent, Bacto beef extract 0.3 per cent, and carbohydrates 0.5 per cent in distilled water, sterilized by autoclave with no pounds pressure on two consecutive days. The final pH was 7.4. Chlorphenol red was employed in 0.0024 per cent concentration as the indicator. The carbohydrates were inoculated from an 18 hour B.T.D.B. culture in the usual manner and incubated at 44° C. for 10 days before the final observations were recorded. Rubber caps were placed over the cotton stoppers to prevent evaporation of the media. In four successive trials fermentation with the production of acid but no gas was obtained from lactose, dextrose, mannose, saccharose, maltose, galactose, xylose, levulose, and raffinose. No acid was produced from mannitol, glycerol, arabinose, inositol, rhamnose, dulcitol, inulin, sorbitol, and salicin. Indol was not produced. Lactic acid was formed.\* The ability of the organism to produce a bacterial phosphatase enzyme is explained in detail below. The organism produced slight acidity in litmus milk with no coagulation. No evidence of growth was observed from gelatine. Direct smears made and stained after 24 hours showed that growth had taken place in all media with the exception of gelatine.

### *Pathogenicity*

To ascertain whether the organism was pathogenic for animals, or any toxic substance was produced in 48 hour broth cultures, the following procedures were carried out: Agar slant washings in 0.85 per cent NaCl and B.T.D.B. cultures containing approximately 1 billion organisms per ml. were injected intravenously, intraperitoneally,

and intracutaneously into rabbits, intraperitoneally and intracutaneously into guinea pigs and mice. Three animals were used for each test and the dosage varied from 1 to 0.1 ml. In this series of tests no illness or symptoms of any kind were observed for a period of 21 days. Twenty-four hour broth cultures were centrifuged at 2,000 r.p.m. and the supernatant fluid injected into animals as previously stated. No abnormal results were observed from the animal used in this series. The organism was repeatedly isolated from the pasteurized milk of a certain dairy during a 2 month period. No illness was reported from the consumption of this milk upon inquiry by the Bureau of Milk Control.

### *Frequency of Occurrence*

The frequency of occurrence of this organism in pasteurized milk and milk products has been partially investigated. It has been isolated from pasteurized milk, cream, and skim milk of four Baltimore dairies. These isolations were obtained, oddly enough, during the winter months. Since then routine thermophilic platings have been made totaling 103 milk and cream samples. From these, 9 thermophilic organisms have been isolated. However, none of these strains have produced the bacterial phosphatase enzyme.

### *Identification*

With the morphological and biochemical reactions obtained, identification of the thermophilic bacillus was attempted. Beaver<sup>10</sup> identified 23 thermophils, and a survey of the literature to 1942 disclosed some 167 strains reported in all. From careful study this thermophilic bacillus does not completely correlate morphologically or biochemically with any of them. It does, however, possess many characteristics of the *Lactobacilli*, especially *Lactobacillus thermophilus*, but several

\* The Friedmann method was employed. *A System of Bacteriology in Relation to Medicine*, 9:144, 1931.

strains of the latter organism when tested failed to produce the bacterial phosphatase enzyme. As this organism appears to be a new strain of the *Lactobacillus* group the name *Lactobacillus enzymothermophilus* is suggested.

#### BACTERIAL PHOSPHATASE

##### *Production of the Bacterial Phosphatase*

To determine the production of the bacterial phosphatase enzyme with a minimum of interference from culture media, etc., it was decided to proceed as follows: Agar slant cultures were grown at 44° C. for 24 hours. The agar washings were performed as rapidly as possible by forcing the distilled water out of the pipette with a rubber bulb and withdrawing it quickly without disturbing or touching the agar. The control suspension was distilled water in contact with uninoculated agar for twice the time it required to make the bacterial suspension. A direct count gave approximately 50 million organisms per ml. of the suspension. The suspension was then centrifuged at 2,000 r.p.m. for 35 minutes. The supernatant fluid was removed and the organisms resuspended in as small a quantity of distilled water as would permit rapid pipetting.

The suspension was then added to milk (negative to the phosphatase test) so that each ml. contained approximately 50 million organisms. In addition, 10 ml. of the suspension was placed in a mortar and ground aseptically with broken glass for approximately 2 hours. Some of the suspension was also resuspended in sterile distilled water. The phosphatase tests obtained on these samples are reported in Table 2.

From the data given in Table 2, it may be seen that there was a negligible difference in the phosphatase units of control number 1 and control number 8. The unwashed, the washed, the ground, the washed and ground organisms all gave negative phosphatase tests. The supernatant fluid in the milk and the supernatant fluid alone gave positive phosphatase reactions of 0.07 and 0.20 Gilcreas units respectively, indicating that the phosphatase of this thermophilic bacillus is extractable.

##### *Effect of Variation in Temperature Upon Bacterial Phosphatase.*

It seemed advisable to determine the effect upon the phosphatase of temperatures above those usually employed for pasteurization, because, if the enzyme is thermostabile, no control for the

TABLE 2  
*Phosphatase Tests on Inoculated Samples*  
*Values in Gilcreas Units*

No. Samples	Kind of Sample	Phosphatase Units
1	Normal pasteurized milk (control)	0.01 Negative
2	Normal pasteurized milk containing 50 million unwashed organisms per ml.	0.03 Negative
3	Normal pasteurized milk containing 50 million washed organisms per ml.	0.02 Negative
4	Normal pasteurized milk containing approximately 50 million organisms ground in glass per ml.	0.02 Negative
5	Normal pasteurized milk 9 ml. containing 1 ml. of supernatant fluid from washed organisms	0.07 Positive
6	Distilled water containing washed and ground organisms	0.01 Negative
7	Fluid from washed organisms	0.20 Positive
8	Distilled water in contact with sterile agar (control)	0.02 Negative

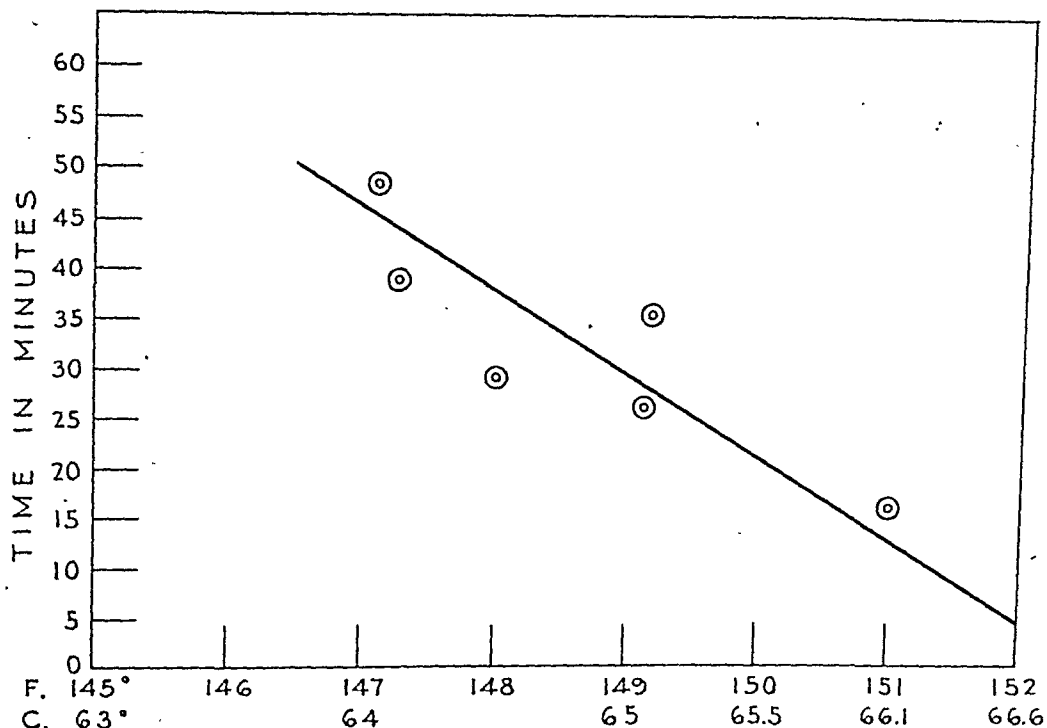


FIGURE 1. Effect of variation in temperature upon thermophilic bacillus.

phosphatase test seemed available. Conversely, if the bacterial phosphatase is thermolabile at temperatures close to or above the pasteurizing point, the significance of controls for the test became apparent. The latter was found to be the case, as the enzyme is destroyed at 85° C. and after boiling for 1 minute.

#### *Production of Bacterial Phosphatase in Milk*

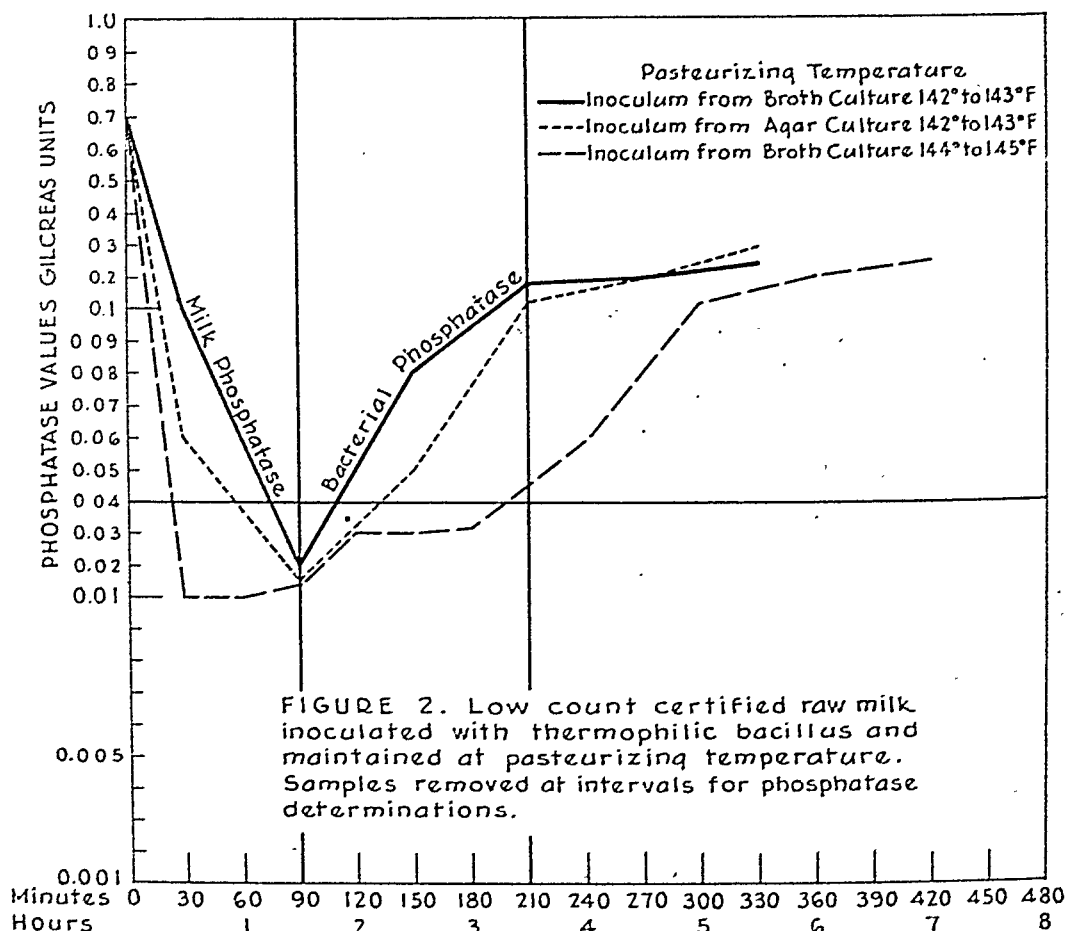
To determine the production in the laboratory of the bacterial phosphatase in milk at pasteurizing temperatures that would at the same time parallel as closely as possible the commercial pasteurizing procedure, the following conditions were set up:

1. The maintenance of temperature within  $\pm 1^\circ$  F.
2. The preheating period of 20 minutes
3. The constant agitation of the milk
4. The prevention of foam

The apparatus assembled consisted of a 10 gallon stainless steel pot containing water. A sterile, paper covered, 2 liter

pyrex beaker was securely wired to a ring stand and submerged in the water to within 2 inches of its top. Motor driven stirrers with sterilized propeller blades were placed in both the beaker and the water. Thermometers were held in place by clamps in the water and in the beaker. The temperatures were checked with a Bureau of Standards certified thermometer. A liter of low-count certified raw milk was placed in the beaker at 42° F. and the culture added so that each ml. of milk contained approximately 10,000 thermophilic organisms. The milk was then brought to pasteurizing temperature by gas flame in approximately 20 minutes. Samples were withdrawn every 10 minutes for the first 30 minutes and thereafter at hourly intervals as shown in Figure 2.

The data shown in Figure 2 give the results of three trials of certified raw milk inoculated with the thermophilic organism and pasteurized for over 5½ hours. The broth culture pasteurized



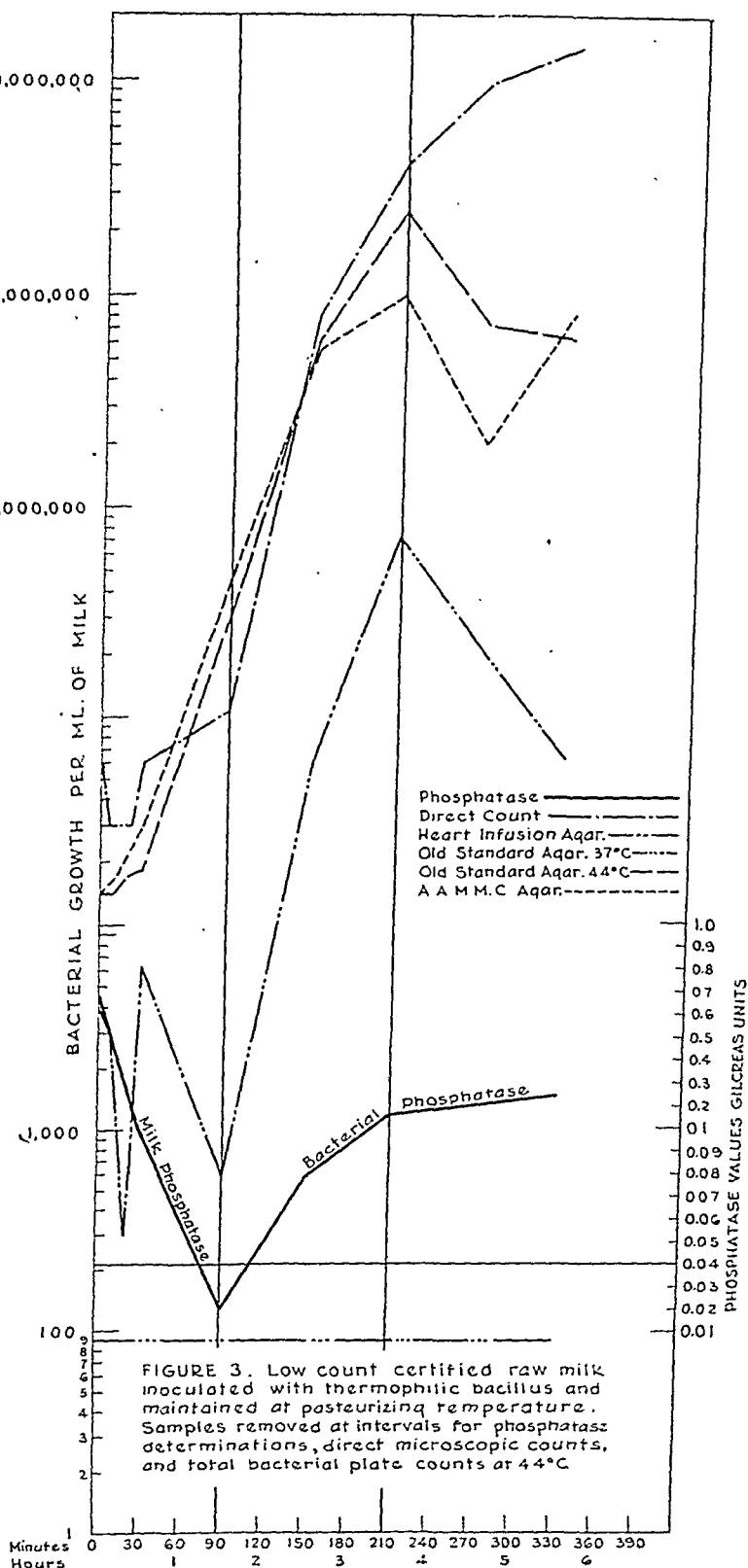
at 144° to 145° F. shows the destruction of the milk phosphatase to below the normal Gilcreas value of 0.04 within the 30 minute time period. The production of the bacterial phosphatase is observed after the inoculated milk had been pasteurized for 90 minutes. This may be considered a critical ordinate, as the production of the bacterial phosphatase begins at this time. During the next 30 minutes, 0.025 bacterial phosphatase units are produced, with no noticeable increase for the next 1 hour period. The total pasteurizing time was 3 hours for this production. There was no significant production of the bacterial phosphatase for the 120 to 180 minute period. The production during the next two periods of 1 hour each is rapid, and 0.06 and 0.12 phosphatase units respectively are produced. The total bacterial phosphatase produced during a 6 hour period of pas-

teurization was from 0.01 to 0.19 units for this trial. It should be noted that milk pasteurized for 3½ hours gave a doubtful or 0.048 phosphatase test.

The other two trials, pasteurized at 142° to 143° F., do not show the complete destruction of the milk phosphatase within the 30 minute pasteurizing period. The agar and broth culture inoculums, however, correlate the findings of Burgwald<sup>11</sup> and others who have established 0.12 to 0.15 Gilcreas units for pasteurizing milk at 142° F. for 30 minutes. Burgwald in one trial reports 0.04 Gilcreas units at 142° F. for 40 minutes. These results are pointed out because samples were not obtained for the phosphatase test between the 30 and 90 minute periods. Straight lines were used to connect these points, and it is therefore obvious that they would have fallen below the normal 0.04 value sooner had samples been tested. The

critical ordinates for the production of the bacterial phosphatase for these two trials are also after the 90 minute period. The production of the bacterial phosphatase from the broth culture inoculum is more rapid than that of the agar culture. The values obtained were 0.08 and 0.05 respectively for the 150 minute period. There is no apparent lag period at this pasteurizing temperature as there was for the 144° to 145° F. trial between the 120 and 180 minute period. The production of the bacterial phosphatase at this temperature is more rapid. Positive phosphatase tests of about 0.05 units from the broth and agar cultures at 120 and 150 minute periods respectively were obtained. The production of 0.1 and 0.15 phosphatase units, broth and agar cultures respectively, were obtained for the two trials at the 210 minute period. A slight but not significant amount of bacterial phosphatase is produced after this time period.

The average production of bacterial



phosphatase for the three trials in the critical 2 hour period was 0.14 Gilcreas

units. The maximum production during the 5½ hour period was 0.25 Gilcreas units.

### *Growth Phase of Thermophil to Phosphatase Production*

To determine the number of thermophilic organisms necessary to produce a significant number of phosphatase units in low-count certified raw milk during pasteurization at 142° to 143° F., the following experiment was conducted. The procedures employed here are the same as those described under *Production of Bacterial Phosphatase in Milk*, except that direct microscopic and plate counts were made on each sample. All plate counts were made in duplicate, using three dilutions, and the technic of *Standard Methods for the Examination of Dairy Products*<sup>12</sup> was employed. The plates were incubated at 44° C. and the counts per ml. of milk are given in Figure 3. The following media were employed for the counts, heart infusion agar,\* O.S.N.A. and A.A.M.M.C.A. Direct microscopic counts were also made. The O.S.N.A. counts at 37° C. incubation and the phosphatase curves are included in Figure 3 for the purpose of orientation.

The data given in Figure 3 show at the 90 minute period the phosphatase unit of 0.02 and the direct microscopic count of approximately 100,000 thermophilic organisms per ml. of milk. The O.S.N.A. and the A.A.M.M.C.A. plate counts per ml. of milk were 130,000 and 145,000 respectively. As previously pointed out, the 90 minute period of pasteurization may be considered a critical ordinate because at this time, the least amount of phosphatase is detected. It is therefore indicated that 100,000 to 140,000 thermophilic organisms by direct microscopic and plate counts have not produced at this period

an appreciable amount of the bacterial phosphatase. The 150 minute period shows an increase of the bacterial phosphatase from 0.02 to 0.08 units, which is the most rapid increase during the entire pasteurization process. The direct microscopic and plate counts show an increase from 100,000 to 3,200,000 organisms per ml. of milk. It is curious to note that a correlation of the direct microscopic and plate counts should occur at this period of pasteurization. This suggests further investigative work, for explanations as to the non-correlation, correlation, and again non-correlation of direct microscopic and plate counts as given on the 90, 150, and 210 minute periods of pasteurization. The 210 minute period shows a bacterial phosphatase production of 0.2 units and the direct microscopic of 39,000,000. The plate counts from O.S.N.A. and A.A.M.M.C.A. of 25,000,000 and 9,500,000 respectively were obtained per ml. of milk. The maximum direct microscopic count obtained was 150,000,000 organisms per ml. of milk at the 330 minute period. The maximum plate count obtained was 25,000,000 per ml. of milk from O.S.N.A. It should be pointed out that the size of the colonies on this medium were quite small, less than 0.5 mm. in diameter, while those observed on the A.A.M.M.C.A. were 3 to 5 mm. in diameter as has previously been stated, and were easily counted.

### *The Rôle of Skim Milk*

The rapidity of the growth of this bacillus in skim milk became significant when it was observed that low count skim milk inoculated gave a direct count of less than 30,000, but after incubation at 44° C. for 6 hours, counts well into the millions were obtained. Samples of skim milk from the dairy were therefore requested for the following reasons:

1. To ascertain if the thermophilic bacillus was present in the skim milk.

\* The heart infusion agar counts are not discussed as they were too low in numbers for correlation purposes.

2. Would the skim milk contain the bacillus in such numbers as to produce a false phosphatase test?

3. Was it obtained from route return whole pasteurized or from raw milk?

4. Was the skim milk being used in other milk products and for standardization?

Two samples of skim milk were received. They were divided into two equal parts. One set of samples was examined immediately for bacteriological counts and phosphatase tests. The other set was incubated at 52° C. for 19 hours and the examinations repeated. The results obtained are given in Table 3.

standardizing the butter fat content may explain the marked difficulty of ridding some dairies of thermoduric or thermophilic bacteria.

#### CONCLUSIONS

1. A false positive phosphatase test was obtained from properly pasteurized commercial bottled milk. The bacterial phosphatase was produced by a thermophilic organism. This organism has been isolated from the products of four Baltimore dairies.

2. The morphological, biochemical, and cultural reactions of this organism indicate that it belongs to the genus *Lactobacillus*. The name *Lactobacillus enzymothermophilus* has been suggested.

TABLE 3

#### *Skim Milk as Received*

Sample Number	Direct Count per ml.	Standard Plate Count per ml. at 37° C. 24 hrs.	Phosphatase Test Gilcreas Units
1.	180,000 many bacilli present	760	0.025 negative
2.	600,000 many bacilli present	290	0.03 negative
<i>Skim Milk after 19 Hours at 52° C.</i>			
1.	6,000,000 many bacilli present	Not made	0.20 positive
2.	6,500,000 many bacilli present	Not made	0.15 positive

The direct microscopic count and the phosphatase test would indicate that the thermophilic bacillus was present in the skim milk and that it had been pasteurized. The skim milk when incubated for 19 hours at 52° C. produced sufficient organisms to give false positive phosphatase tests, and repasteurization of the samples in the laboratory did not destroy the phosphatase enzyme. This suggests that the skim milk was obtained by separating route returned bottled pasteurized milk, which was confirmed by the Health Department inspector and the dairy plant proprietor. It would seem logical to expect that the continuation of this practice would act as a continuous inoculum and result in a marked increase of these organisms in the bottled product. The simple practice of continued reinoculation of raw milk with skim milk obtained from route returned pasteurized milk for

3. The bacterial phosphatase was extracted from the organism with distilled water. A phosphatase test of 0.20 Gilcreas units from 0.5 ml. of the fluid was obtained by washing approximately 50 million organisms in 10 ml. of distilled water. This bacterial enzyme was destroyed after exposure to 185° F. for 1 minute.

4. Production of the bacterial phosphatase in milk at pasteurizing temperatures of 142° to 144° F. begins after a 90 minute holding period. Two hours after the start of the enzyme production at 142° F. a phosphatase test of 0.20 Gilcreas units was obtained. At the 144° F. temperature a lag in the enzyme production is noted for 180 minutes, and the production thereafter is rapid.

5. The factors governing the production of the bacterial phosphatase are the inoculum number, the temperature and the time period. In one pasteurizing trial at 142°-143° F. for 150 minutes the direct microscopic, Old Nutrient Standard agar, and the American Association of Medical Milk Commission agar counts correlate to give approximately 3,200,000 bacteria per ml., and a phosphatase test of 0.03 Gilcreas units per 0.5 ml. of milk was obtained. The maximum direct micro-

scopic count of 150 million organisms per ml. of milk was obtained after 5½ hours of pasteurizing milk at 142°–143° F. and the phosphatase test gave 0.25 Gilcreas units per 0.5 ml. of milk.

6. It is an established fact that skim milk is an excellent culture medium. The rapid growth of this organism in skim milk and other media at favorable temperatures, 112° to 126° F., is readily observed within 1½ hours *in vitro* from rapid transfers. It has been shown that skim milk obtained from a dairy plant and used for standardizing, produced a false positive phosphatase test when the thermophilic organisms were in sufficient numbers. Raw milk heated for separating may be a contributing factor for promoting the growth of this and other thermophils. The practice of separating route return pasteurized milk for standardizing with thermoduric or thermophilic organisms present may be considered as a continuous reinoculation process. This practice may explain many positive phosphatase tests attributed to manual and mechanical defects in the dairy plant, when actually the false positive phosphatase test has been produced by a bacterial phosphatase enzyme from a thermophilic organism.

#### COMMENT

In studying the so-called "phosphatase test" as a control procedure for pasteurized milk, it has been learned that the milk phosphatase in raw or improperly pasteurized milk is a different substance from bacterial and other phosphatases that may be present in properly pasteurized milk where there has been a growth of non-pathogenic thermophilic organisms. Care is therefore necessary in distinguishing among the phosphatases where the phosphatase

test is used in milk control work and where a false positive test due to a bacterial phosphatase may lead to a misinterpretation of the laboratory findings.

ACKNOWLEDGMENT—The author is indebted to Huntington Williams, M.D., Commissioner of Health of Baltimore, for his valuable suggestions, to C. L. Ewing, Director of the Bureau of Laboratories, for assistance in this work, and in particular to Emanuel Kaplan, Sc.D., Chief, Division of Chemistry, who performed the phosphatase tests; Katherine Welsh, Anne Burkhard, and Margaret West of the Food Laboratory for their technical assistance in this work.

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# A Method for Determining the Number of Beds Required for Convalescent Care of Rheumatic Infections

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PROLONGED convalescent care for those recovering from rheumatic episodes is proving itself the best method available for combating that most serious manifestation of the rheumatic syndrome—rheumatic heart disease.<sup>1</sup> Provision of adequate convalescent facilities in London has apparently resulted in a reduction of the incidence of organic acquired heart disease from 2.0 per cent in 1926 to 0.8 per cent in 1936.<sup>2</sup> An increasing awareness of the need for facilities and for organization of convalescent care similar to that in England is manifest in this country.<sup>3</sup>

In view of the prospect that public health organizations will become aroused to plan for similar care of our rheumatic population, there is need for a method to estimate how many beds would be necessary in given communities in different parts of the United States. In England, when the London Rheumatism Scheme was organized in 1926, there was no clear idea of the exact number of beds required, but it was judged that an average of 6 months' care should be provided for every child with rheumatic infection. Facilities were slowly expanded until that ideal was reached. It was found that 1 bed per 550\* elementary school children permitted ade-

quate convalescent care to be given rheumatic infections in that age group.<sup>3a, 5</sup> Another estimate was 6 to 8 beds for school children per 100,000 total population.<sup>6</sup> This latter method is a combination of American and British ideas. The British component was based on the assumption of 1 year's convalescent care during a 25 year duration of rheumatic infection with a known mortality of 149 persons per 100,000 in England and Wales.<sup>7</sup> Thus 6 beds in 25 years would provide for 150 patients.

Both ratios have been used recently in the United States to estimate needs for convalescent care in two of our largest cities; the 1:550 ratio by Swift<sup>3a</sup> in New York City, and the 6 to 8 per 100,000 ratio by Hedley<sup>8</sup> in Philadelphia. These methods yield very divergent estimates. The former method calls for a far larger number of beds than does the latter. Furthermore it is obvious that any method of estimating beds based on school population, total population, or mortality cannot be applied throughout the United States because of well known regional differences in incidence<sup>9</sup> and mortality<sup>10</sup> of rheumatic infections.

The alternative method of starting on a small scale and expanding facilities slowly to meet the demand, as suggested by Huse,<sup>11</sup> is safe and apparently eco-

\* An earlier estimate was 1.7 beds per 1,000 children.<sup>4</sup>

nomical, but it deprives many persons of needed care during the period of expansion. If convalescent care is as beneficial as we hope it is, such a procedure may not be economical in the long run.

How then is the necessary number of convalescent beds to be estimated in various localities of this country, if the ratios derived in England cannot be applied? We believe this can be done by using a 1:2 ratio, namely, 1 bed for every 2 rheumatic cases hospitalized annually in the community.

#### THE SITUATION WHICH PERMITS EVOLVEMENT OF THIS 1:2 RATIO

Cincinnati is unusual in that there is adequate convalescent care available for white rheumatic children aged 2 to 12. This care is provided by the Children's Convalescent Home of Cincinnati which was opened in 1931 to provide convalescent care for cardiac, orthopedic, post-operative, post-communicable disease and malnutrition cases.<sup>12</sup> Children are admitted from hospitals, clinics, and all child welfare agencies in the city and Hamilton County. It is supported by funds from the Community Chest and admits white children of both sexes from 2 to 12 years of age, inclusive. There are a few children 13 to 15 years old. No facilities are provided for the care of colored children. This institution has 100 beds, with an average daily census of 80.

During 1931-1940 there was a total of 2,614 admissions to the Children's Convalescent Home for all causes, of which 13 per cent were for rheumatic conditions. At no time were the facilities strained, and it can be said that all white children aged 2 to 12 who required care for a rheumatic condition were in a position to receive it. This applies particularly to children of the poorer classes. Some children, of course, did not receive this care when they needed it because of unwillingness

of parents to place them in an institution. Others may not have received it because some physicians are unaware of the benefits of convalescent care. However, these factors operate in every community, and we believe that facilities for care of this particular age and racial group are quite adequate in Cincinnati. The proportion of the rheumatic burden borne by this institution is indicated by the fact that 56 per cent of all patient-days for rheumatic admissions in all Cincinnati hospitals during 1930-1940 were spent at Children's Convalescent Home.

#### PROCEDURE IN OBTAINING THE 1:2 RATIO

The authors have recently completed a survey of all hospital admissions for rheumatic infections in Cincinnati for the 11 year period 1930-1940.\* During this time 515 white patients under 13 were admitted with rheumatic infections to all Cincinnati hospitals, or 47 per year. In the 10 years (1931-1940) of operation of Children's Convalescent Home, 268 white children under 13 were admitted to that institution with rheumatic infections. On each admission, the average stay was 233 days. Including readmissions, during these 10 years each child was in the home 286 days, or a grand total of 76,763 patient-days. When this total is divided by 365 days, the quotient is 210. This means that 210 beds, or 21 beds per year, were constantly occupied by patients convalescing from rheumatic episodes. To keep an average of 21 beds per year in constant use, about 24 available beds (88 per cent occupancy) would be required. Thus, over a 10 year period, 24 beds per year at Children's Convalescent Home were needed in relation to the 47 cases among white children under 13 admitted

\* *Rheumatic Heart Disease, Rheumatic Fever, and Chorea.* To be published.

annually to Cincinnati hospitals. Therefore, to provide adequate convalescent care, 1 bed for convalescents should be available for every 2 hospital cases of rheumatic infection per year.

It should be recalled at this point that, when the Rheumatism Scheme was organized in London, the preliminary estimate was an average of 6 months' care for each rheumatic child. Here in Cincinnati where no preliminary estimate was made, but convalescent care provided freely as needed, the same ratio emerges from 10 years of experience, *i.e.*, 1 bed for every 2 cases, or, in other words, an average of 6 months' care for each case. Actually, not every case comes in for care, and some stay less than 6 months and some more. In Children's Convalescent Home every rheumatic admission averaged 8 months.

This compares favorably with the average care given in other localities—8 months in Boston,<sup>13</sup> and 8.3 months in New York.<sup>1c</sup>

#### APPLICATION OF THE 1:2 RATIO

Thus, if a community were contemplating provision of convalescent care for its rheumatic children, a survey over a 2 to 3 year period should be made of cases admitted for rheumatic conditions to hospitals of that community. If any considerable number of patients were admitted to more than one hospital, such duplications should be eliminated. The average number of cases admitted per year in the age group for which care is contemplated should be obtained, and 1 bed provided for every 2 cases.

For example, in Philadelphia there

TABLE 1

#### Estimate of Convalescent Needs by Three Methods

City	1:2 Ratio		1:550 Children		7 per 100,000 Popula- tion <sup>h</sup>
	Annual Rheumatic Hospital Cases Under Age 15	Beds Needed Under Age 15	Children Age 7 to 15 <sup>d</sup>	Beds Needed Age 7 to 15	Beds Needed Under Age 16
New York City	3,116 <sup>a</sup>	1,558	1,037,539 <sup>e</sup>	1,886 1,760 <sup>f</sup>	522
Philadelphia	383 <sup>b, g</sup>	192	305,322	555	135 203 <sup>i</sup> 200 <sup>b, i</sup>
Cincinnati	66 <sup>k, c</sup>	33	59,334	108	32 44 <sup>j</sup> 55 <sup>i</sup>

a. Approximately 2,181 hospital cases under age 14 with rheumatic heart disease (cf. Swift,<sup>1a</sup>) on the assumption that R.H.D. is 70 per cent of all rheumatic infections under age 15 (Cincinnati 67 per cent; Philadelphia 71 per cent).

b. For 1930-1934, cf. Hedley<sup>8</sup>

c. For 1930-1940, data to be published by the authors

d. 1930 Census

e. Including Bronx, Brooklyn, Manhattan, Queens, Richmond

f. For children under 16; cf. Swift<sup>2a</sup>

g. An undetermined number outside of Philadelphia proper, but in the metropolitan district

h. 1940 Census

i. For the metropolitan district

j. Hamilton County, served by Cincinnati hospitals

k. An undetermined number outside of Cincinnati proper, but in Hamilton County

was an average of 383 cases of both white and colored children under 15 with rheumatic conditions admitted to hospitals per year over a 5 year period.<sup>8</sup> To provide convalescent care for Philadelphia's rheumatic children under 15 alone would require 192 beds.

Examples of difficulties that arise when the English ratios are applied to American communities may be seen in Table 1. In Cincinnati the ratio of 1 bed for 550 elementary school children would provide Cincinnati with 108 beds, not the 33 which we know would be ample for both races under 15 years in an average year. Use of the ratio of 7 beds per 100,000 population would give Cincinnati 32 beds if the population of the city alone were used, but 44 if the population of Hamilton County were considered.

In Philadelphia the 1:550 ratio would provide 555 beds. Hedley made his estimate on the basis of the ratio 6 to 8 per 100,000 population and obtained 200 beds. The 1:2 ratio estimates 192 beds, in good agreement with Hedley's figure.

However, in New York City, Swift made his estimate with the 1:550 ratio and obtained 1,760 beds. A calculation based on 7 beds per 100,000 population, as used by Hedley, yields only 522 beds. Our estimate based on the 1:2 ratio is 1,558 beds, which is reasonably close to Swift's figure.

The 1:2 ratio is the one method which consistently approaches the estimates of Swift and Hedley. Yet if each had used the other's method of estimation the results would have been different. Actually each author used the method which worked best for the city under consideration.

The experience in London further verifies the applicability of the 1:2 ratio. In 1926, during the early stages of organization of the London Rheumatism Scheme, there was an estimate of 2,033 children<sup>4</sup> admitted annually to

London hospitals with rheumatic infections. By 1936, 1,100 convalescent beds had been provided.<sup>6</sup> This is essentially 1 convalescent bed in 1936 for every 2 cases hospitalized in 1926.

#### DISCUSSION

It should be emphasized that convalescent facilities in Cincinnati are adequate only for the limited group under consideration; white children aged 2 to 12. The only other institution in the city which has significant convalescent facilities is the Hamilton County Chronic Disease Hospital. Although designed to care for the indigent aged, it also serves for a few cases as a place for convalescence for white patients over the age of 12 and for Negroes convalescing from rheumatic infections. However, these facilities are unsuitable and inadequate. There is an acute need in Cincinnati for convalescent beds for Negro children and for all young adults. We estimate the number of beds necessary for Negro children as 6. The convalescent needs of young adults will be discussed in a future publication.

Before applying the 1:2 ratio, a community survey of hospital cases of rheumatic infections is necessary. Some may object to the expense incurred by a survey. In reply it can be pointed out that the cost of a convalescent institution may be as high as \$4,000 per bed.<sup>2</sup>

Communities using the 1:2 ratio would be unlikely to provide too many beds but might provide too few. This would happen if most acute episodes of rheumatic infection were treated in the home rather than in a hospital. It could also occur if, after a survey had been made, an increasing awareness of the seriousness of rheumatic infections caused more cases to be recognized and hospitalized.

It is important to realize that the adequacy of recognition of rheumatic infections in Cincinnati has little to do

with the validity of the 1:2 ratio. Since available facilities at Children's Convalescent Home have never been saturated, any increased number of rheumatic cases admitted to hospitals would simply have been reflected by increased admissions to the home, in the same 1:2 ratio as at present.

#### SUMMARY

There is an increasing awareness in the United States of the value of convalescent care for rheumatic infections, and of the lack of such facilities in this country. A method is needed to determine the number of beds required for convalescent care in a given community. Over a 10 year period the facilities for the care of rheumatic white children aged 2 to 12 have never been saturated at the Cincinnati Children's Convalescent Home. A survey of admissions to all Cincinnati hospitals has revealed the total number of these children, and the total patient-days spent by them at Convalescent Home. Based on this experience it has been found that 1 convalescent bed was required for every 2 cases admitted to Cincinnati hospitals. It is suggested that this 1:2 ratio be considered by communities intending to expand their facilities for care of convalescent rheumatic children.

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# Some Epidemiological Aspects of Tooth Decay\*

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EXPERIENCE in the present war and in those of the past, together with related incidental data, offer opportunity to examine, on a geographic basis, certain epidemiological aspects of tooth decay. From an etiological standpoint, knowledge as to this disability is about on a par with speculations in the early part of the century as to the etiology of pellagra or knowledge as to the causation of malaria before Laveran's work in 1880.

Generally speaking, there are two schools of thought regarding the etiology of tooth decay. The first group considers the oral environment the sole determining factor, while the second group considers that the metabolic processes of the body influence the resistance of the teeth to the force or forces which cause decay. Whatever the merits of these or other hypotheses, they have no bearing on the present discussion.

The data herein presented for consideration consist of: (1) the rejection rates for "defective and deficient" teeth among the men in the draft for the United States Army in 1918; (2) exemption rates for "loss of teeth" among men drafted for the Federal Army in 1863-1864; (3) rates of past and present decay attacked teeth among

U. S. Naval recruits in 1934, and surveys of tooth decay among United States school children.<sup>4, 5, 6</sup>

In this paper tooth decay includes past as well as present evidence of caries attack. It is realized that diseases other than tooth decay may contribute to the condition later referred to as "defective and deficient" teeth, or "missing" teeth, yet it is believed that among the age groups under consideration the effects of such diseases on the magnitude of the rates would be so relatively minor that they may be disregarded.

## DENTAL REJECTION RATES AMONG DRAFTEES OF 1918

During World War I, the physical condition described as "defective and deficient" teeth caused the rejection of significant numbers of men called up for military service from the various states. There were two drafts during that war. The first was in 1917, the second in 1918. Only the data of the 1918 draft are considered in this discussion. This draft has been referred to as that of the "second million." The 1918 mean rejection rate for the entire country for "defective and deficient" teeth was 24.2 per 1,000 men examined at the army camps.

The examinations were made subsequent to May, 1918. This indicates that most of the examiners at the army

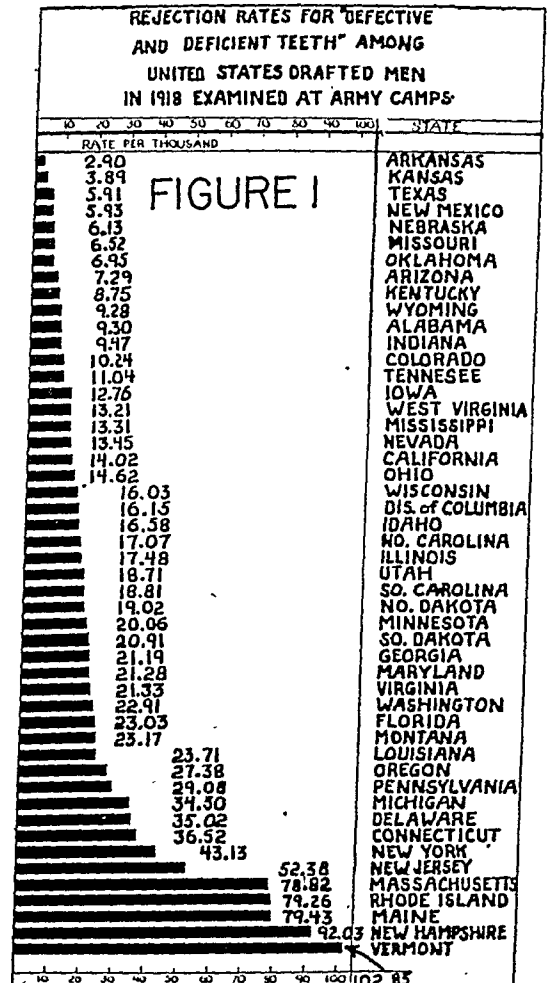
\* Read before the Epidemiology Section of the American Public Health Association at the Seventy-Fifth Annual Meeting in St. Louis, Mo., October 30, 1942.

camps and the local boards probably had had a year or more to become familiar with the criteria and examining technics. Therefore, it does not seem unreasonable to assume that considerable uniformity would prevail, resulting in state rates, the magnitude of which may be properly compared one with another.

However, the states varied in the magnitude of their respective rejection rates. The Vermont rate was 102.85, while that of Arkansas was 2.90 per 1,000 men examined. The highest rates were among 5 New England states. The remaining state of that geographical group was 8th in rank among the 48 states and the District of Columbia. The mean rate for the New England states, as a group, was 76.15. The lowest rates were consistently among the southern and southwestern states. For example, the group composed of Arkansas, Texas, and New Mexico had a mean rate of 4.66 per 1,000 men examined.\*

Unfortunately, the rejection rates for "defective and deficient" teeth at the local boards of 1918 are not available. However, when the rejection rates at the local boards for *all* types of physical defects are examined, it is found that the states with the high rates had, as a rule, high rejection rates for "defective and deficient" teeth at the army camps. This point seems important when comparing the magnitude of the several states' army camp rejection rates, because it helps to eliminate the possibility that the variations resulted entirely from careless screening at the source. The degree of correlation be-

tween high rejection rates for all types of physical defects at the local boards of the 48 states and the District of Columbia and high rejection rates for "defective and deficient" teeth at the army camps during the 1918 draft was determined by the correlation coefficient of Pearson. A value of  $+ .63 \pm .09$  was obtained. This is a further indication that on the average the higher the rejection rate at the local boards for all types of physical defects, the higher was the rejection rate for dental defects at the army camps. The rejection rates at the army camps and at the local boards among the various states and the District of Columbia are given in Table 1. The rates for the 48 states and the District of Columbia are shown graphically in Figures I and II.



\* Several preliminary statistical reports of dental findings among draftees of the several states during 1940-1942 suggest that the New England states will again have the highest rejection rates at both the local boards and at the Army Induction Centers for dental defects, and that the southern and southwestern states will have the lowest rates; however, it is believed that the available data are too meager to permit a final conclusion to be drawn in this respect at the present time.

TABLE 1

*Rejection Rates for "Defective and Deficient" Teeth among Draftees of Various States at Army Camps and for All Types of Physical Defects at Local Boards During 1918 (A);  
Rejection Rates for "Loss of Teeth" among Draftees of Northern States for Federal Army During 1863-1864 (B)*

State	Draftees of 1918				Draftees of 1863-1864	
	Rejection Rate per 1,000 Men for "Defective and Deficient" Teeth at Camps		Rejection Rate per 1,000 Men for All Types of Physical Defects at Local Boards		Rejection Rate per 1,000 Men for "Loss of Teeth"	
	Order of Magnitude	Rate	Order of Magnitude	Rate	Order of Magnitude	Rate
Vermont	1	102.85	2	286	8	20.57
New Hampshire	2	92.03	30	133	5	25.05
Maine	3	79.45	3	268	14	10.21
Rhode Island	4	79.26	1	369	6	22.46
Massachusetts	5	78.82	7	188	1	34.87
New Jersey	6	52.38	22	137	9	20.19
New York	7	43.13	12	168	2	27.56
Connecticut	8	36.52	10	169	3	26.53
Delaware	9	35.02	38	120	15	7.62
Michigan	10	34.50	15	157	12	13.11
Pennsylvania	11	29.08	27	135	4	25.70
Oregon	12	27.38	19	145	..	.....
Louisiana	13	23.71	18	150	..	.....
Montana	14	23.17	43	98	..	.....
Florida	15	23.03	34	126	..	.....
Washington	16	22.91	5	204	..	.....
Virginia	17	21.33	17	154	..	.....
Maryland	18	21.28	4	219	11	16.57
Georgia	19	21.19	35	126	..	.....
South Dakota	20	20.91	29	134	..	.....
Minnesota	21	20.06	26	135	7	22.08
North Dakota	22	19.02	40	108	..	.....
South Carolina	23	18.81	37	122	..	.....
Utah	24	18.71	14	157	..	.....
Illinois	25	17.48	20	143	..	.....
North Carolina	26	17.07	32	131	..	.....
Idaho	27	16.58	39	114	..	.....
District of Columbia	28	16.15	33	128	..	13.75
Wisconsin	29	16.03	31	131	16	5.39
Ohio	30	14.62	21	141	10	18.87
California	31	14.02	6	203	..	.....
Nevada	32	13.45	36	123	..	.....
Mississippi	33	13.31	42	104	..	.....
West Virginia	34	13.21	41	105	..	.....
Iowa	35	12.76	16	155	..	.....
Tennessee	36	11.04	9	174	..	.....
Colorado	37	10.24	8	179	..	.....
Indiana	38	9.47	25	135	..	.....
Alabama	39	9.30	45	91	..	.....
Wyoming	40	9.28	48	64	..	.....
Kentucky	41	8.75	13	165	13	10.98
Arizona	42	7.29	49	12	..	.....
Oklahoma	43	6.95	28	134	..	.....
Missouri	44	6.52	24	135	..	.....
Nebraska	45	6.13	47	78	..	.....
New Mexico	46	5.93	11	169	..	.....
Texas	47	5.91	23	135	..	.....
Kansas	48	3.89	46	89	..	.....
Arkansas	49	2.90	44	93	..	.....

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year 1934. While the men in that naval group and the condition of their teeth differed from the rejected draftees, inasmuch as they were found suitable for military service, yet the method used in determining their dental status allows an estimate of the relative prevalence of caries, past and present, among the teeth of men of the various states. In the naval survey under consideration there were 4,602 white men. After enlistment they were assembled at Norfolk, Va., where they were examined by the same dentist\* and their present and past tooth decay experience was recorded according to the number of decayed, missing or filled (DMF) teeth. On subsequent study by the naval investigator it was found that, as

a rule, the men of the northern states had more evidence of tooth decay, past and present, than did men from the southern states. The state with the highest rate, 12.54 decayed, missing, or filled (DMF) teeth per man was Connecticut—a New England state. Arkansas, the state with the lowest rejection rate for “defective and deficient” teeth at the army camps in the draft of 1918, likewise had the lowest decayed, missing, or filled (DMF) rate among these naval recruits of 1934. The New England states, as a group, had the highest rate in the entire series, 11.48; while Arkansas, Louisiana, and Mississippi, as a group, had a mean rate of 3.5 DMF teeth per man. The consistency with which these naval data tend to agree with the dental findings collected among men of the several states

\* Lieutenant Commander R. A. Ferguson

TABLE 2

*Mean Number of DMF (Decayed, Missing or Filled) Permanent Teeth among 4,602 White, United States Naval Recruits During 1934, Arranged According to the Magnitude of the Various State Rates (A)*

State	Order of Magnitude	DMF Rate per Man	State	Order of Magnitude	DMF Rate per Man
Connecticut	1	12.54	Oregon		
Massachusetts	2	12.20	Montana		
Pennsylvania	3	11.40	Washington		
Rhode Island	4	11.00	North Dakota		
New York	5	10.84	Utah		
Ohio	6	10.53	Idaho	16 ‡	6.00 ‡
New Jersey	7	10.30	California		
Vermont			Nevada		
New Hampshire	8 *	10.20 *	Colorado		
Maine			Wyoming		
Delaware			Arizona		
Maryland	9 †	9.70 †	New Mexico		
District of Columbia			South Dakota	17	5.30
Illinois	10	9.25	Missouri	18	4.40
Minnesota	11	9.10	Indiana	19	4.38
West Virginia	12	7.90	Kentucky	20	4.30
Michigan	13	7.14	Iowa	21	4.10
Wisconsin	14	7.00	Louisiana		
Nebraska	15	6.80	Virginia		
			South Carolina	22 ‡	4.00 ‡
			Oklahoma		
			Texas		
			Kansas		
			Florida	23	3.60
			North Carolina	24 **	3.50
			Alabama		
			Georgia	25 **	3.40 **
			Mississippi		
			Tennessee	26	3.20
			Arkansas	27	3.00

\* Mean rate for the three states

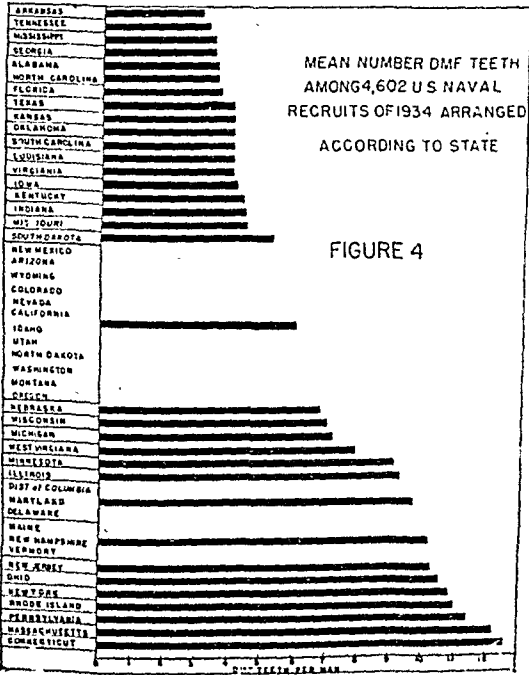
† Mean rate for the two states and District of Columbia

‡ Mean rate for the twelve states

\*\* Same value appears for indicated states

(A) Ferguson, R. A. Some Observations on Diet and Dental Disease. *J. Am. Dent. A.*, 22:592-593 (Mar.), 1935.

at different times over a period of some 70 years seems to allow greater weight to be given them as being representative of the universe from which they were drawn than would ordinarily be the case where the numbers in the samples are relatively small. The rates for the several states and the District of Columbia are shown in Table 2 and Figure IV.



forces which tended to operate to produce dental diseases, particularly tooth decay, were not haphazard but more or less constant over a considerable period.

Most of the lesions of tooth decay which eventually caused the rejection of men in the several drafts or which caused the men in the naval group to have decayed, missing, or filled (DMF) teeth, had their inception when the individuals were relatively young, when their permanent teeth had been erupted a relatively short period. Therefore, as complementary to a study of the extent of dental defects among men of military age, it seems desirable to examine data as to permanent teeth of children in various parts of the United States.

Several dental surveys among children have demonstrated the geographical distribution of tooth decay. Mitchell<sup>7</sup> found that the white children of Puerto Rico had less tooth decay than did children of the same age and color in the United States. Moore<sup>8</sup> contrasted the dental condition of 393 preschool children in San Diego, Calif., with 550 children of the same age in Portland, Ore. He reported that 54.5 per cent of the San Diego children were without dental caries experience, while among the Portland children 22.5 per cent were without past or present tooth decay. In an extensive survey by private dentists coöperating with the U. S. Public Health Service during 1933-1934, the dental findings among some 1,500,000 school children are reported.<sup>9</sup> It was found that the dental caries prevalence rates of the permanent teeth of children residing in different states varied greatly in their magnitude. For example, it was found that the mean number of permanent teeth attacked by decay among boys aged 13 residing in cities having a population of 100,000 or over of the states of Florida, Virginia, and Massachusetts was 3.09, 4.17, and 5.69 respectively. In Table 3 the mean

The Pearsonian correlation coefficient was used to determine the degree of relationship between high rejection rates at the army camps for "defective and deficient" teeth among the draftees of 1918 and high DMF rates among the naval recruits of 1934. The rates that were based on grouping the men of two or more states, as was done in the original report for 17 states, have been omitted from the calculations. The value of *r* was found to be  $+ .70 \pm .09$ . This value indicates a relatively high and statistically significant correlation between high rejection rates for dental defects among the men of military age of 31 states in 1918 and high DMF rates among the young men of the same age 16 years later: that the force or

number of decayed, missing, or filled permanent teeth among Florida, Virginia, and Massachusetts city boys aged 7, 10, and 13 respectively is given, together with the number of children composing each sample.

TABLE 3

Mean Number Decay Attacked Permanent Teeth among Three Age Groups of Boys Residing in Florida, Virginia, and Massachusetts Cities Having Populations of at Least 100,000 (A)

Mean Age Last Birthday	7	10	13
<i>Florida</i>			
Number of Children Examined	2,878	3,479	1,220
Mean Number of Decayed, Missing, or Filled Permanent Teeth	0.71	1.92	3.09
<i>Virginia</i>			
Number of Children Examined	1,350	1,492	951
Mean Number of Decayed, Missing, or Filled Permanent Teeth	0.93	2.60	4.17
<i>Massachusetts</i>			
Number of Children Examined	1,353	1,425	1,308
Mean Number of Decayed, Missing, or Filled Permanent Teeth	1.87	3.83	5.69

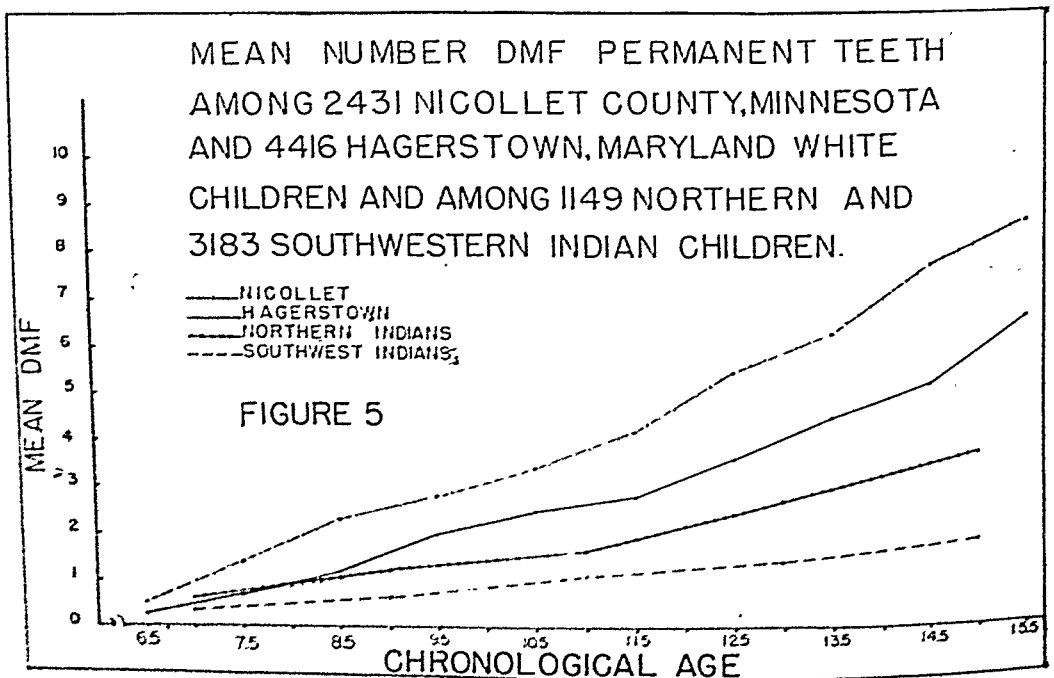
(A) Messner, C. T., et al. Dental Survey of School Children, Ages 6-14 Years Made in 1933-1934 in Twenty-six States. *Pub. Health Bull.*, 226, 1936.

Because the surveys among children

which have just been referred to were made by groups of private practitioners, it has been suggested by some that differing criteria and methods of reporting might tend to vitiate them. Four other sets of data are presented which seem to be relatively free from such defects because the examinations were all made by members of the dental staff of the U. S. Public Health Service. This leads to the assumption that unusual uniformity would prevail in the data and that the relative magnitude of the different rates may be used as a reliable measure of the severity and extent of the disease among the different groups.

Two of these groups were whites who resided at Nicollet County, Minn., and Hagerstown, Md., respectively. The remaining two groups were Indian children who lived on reservations in northern and southwestern localities of the United States.

The decayed, missing, or filled rates among the permanent teeth for the various age groups of children are given in Table 4 and are shown, graphically, in Figure V. The values demonstrate



that, among these groups of children residing in different environments, the number of permanent teeth \* attacked by caries at a given age differs, as do the rejection rates among the men of the Army drafts, and the DMF rates in the 1934 naval group. That is, the children who resided in the more northerly locations had greater evidence they were children. In suggesting the probability of such a relationship; it is assumed that the distribution of corrective dental service would be at least as great among the population of the states with the high attack rates as among those enjoying the lower rates. While factors associated with latitude have been chosen to illustrate epidemio-

TABLE 4

Mean Number Decayed, Missing, or Filled (DMF) Permanent Teeth among 2,431 Nicollet County, Minnesota (A), and 4,416 Hagerstown, Md. (B), White Children; and among 1,149 Northern and 3,183 Southwestern Indian Children (C)

Age Last Birthday →	6	7	8	9	10	11	12	13	14	15
Locality	Number DMF (Decayed, Missing or Filled) Permanent Teeth per Child									
Nicollet Count, Minn.	0.51	1.43	2.30	2.85	3.39	4.16	5.49	6.32	7.69	9.62
Hagerstown, Md.	0.29	0.72	1.19	2.01	2.51	2.84	3.65	4.54	5.21	6.47
Northern Indians	.....	0.63	....	1.27	....	1.67	....	2.75	....	3.70
Southwestern Indians	.....	0.37	....	0.68	....	1.47	....	1.88	....	2.70

(A) Knutson, J. W. Appraising the Dental Health Program. *J. Am. Dent. A.*, 29:543-556 (Apr.), 1942.  
(B) Klein, Henry, Palmer, C. E., and Knutson, J. W. Studies on Dental Caries, I. Dental Status and Dental Needs of Elementary School Children.  
(C) Klein, Henry, and Palmer, C. E. Dental Caries in American Indian Children. *Pub. Health Bull.*, 239 (Dec.), 1937.

of past and present tooth decay than did those of more southerly areas. Among these groups of children the relationship between the number of attacked teeth and time approaches linearity, the curves only differing in their slope. This relationship persists in spite of the fact that the number of permanent teeth erupted, and therefore eligible for caries attack, increased from approximately 6 to 28 during the age periods studied. The data suggest that the relative dental fitness of the men of military age of the various states probably could have been predicted with considerable reliability from the relative condition of their teeth when logical aspects of dental disease, it should be emphasized that other conditions and circumstances could and probably do influence and contribute to tooth decay. Dean,<sup>10, 11, 12</sup> in his extensive investigations of the relationship between fluorine in communal water supplies and caries resistance, offers another illustration of the importance of introducing epidemiological methods when considering the phenomenon of tooth decay and its distribution among the population.

SUMMARY

Apparently there are marked differences in the distribution of dental diseases among groups of the population residing in various states of the United States. These differences are reflected in the magnitude of the rejection rates for dental defects among men who have been drafted for military service. When the rejection rates of the states contributing to more than one draft are listed according to magnitude, con-

\* It has been assumed that the numbers of the various types of permanent teeth erupted at a given age would not differ among the children of the different localities. However, this is only a working hypothesis and has not been tested by extensive data. It has been found that no significant difference in this respect existed between the Hagerstown, Md., children and a similar age-sex group of Chicago, Ill., children. (Greenwald and East: Eruption Tables of Permanent Teeth of Chicago School Children. *Illinois Dent. J.*, Sept., 1941.)

siderable uniformity is observed in the resulting order of arrangement for each draft period. The possibility that these recurring phenomena can be explained entirely by chance and, or, by differing examining technics and criteria, is discussed and considered unlikely. Evidence tending to substantiate the probability that the observed differences are representative of the relative extent of the disease among the population of the respective states is offered by data resulting from the examination of naval recruits during 1934. The reasonableness of the hypothesis is further supported by data stemming from surveys of the extent of tooth decay among children residing in different geographical areas. The relationship between latitude and dental diseases, particularly tooth decay, has been used to illustrate some of the epidemiological aspects of the problem, but it is emphasized that many other known and unknown conditions and circumstances may, and undoubtedly do, influence the disease and its distribution. It is suggested that the study of dental diseases offers a particularly interesting and

profitable field for the use of epidemiological methods.

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# Syphilis Control in a State Prison

## III. A Centralized Syphilis Control Program for the State Prisons of New York \*

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IN previous communications<sup>1,2</sup> we have described the marked improvement occurring in the care of syphilitic inmates at Sing Sing Prison following the inauguration of a specific program. As a result of the reevaluation of the status of each individual with syphilis there occurred a huge reduction in the number of inmates under treatment and a more adequate type of therapy for those who required it. We made the observation that imprisonment for an extended period might be interpreted, paradoxically, as a beneficial event in the life of a syphilitic, as it enabled him to receive a complete diagnostic appraisal and adequate therapy for his disease under conditions more suitable than those encountered by him in civilian life. In proof of this it was shown that, whereas only 13.5 per cent of those with a knowledge of the disease for 5 years or more had received adequate therapy prior to admission, 85 per cent of those requiring antisyphilitic treatment at the time of admission had fully completed that therapy 2 years later. In addition, we have indicated that the placement of a large number of syphilitic individuals under supervision for prolonged periods offers an

unusual opportunity for the investigation of problems referable to the course of syphilis and its treatment.

Because of the methods of reception and transfer of inmates within the New York State penal system, the above program at Sing Sing Prison was not complete by itself. Sing Sing Prison is a "receiving" institution and admits about 70 per cent of the total number of prisoners entering the state penal system. A number of these inmates are transferred each month to other state institutions, namely Attica, Auburn, Clinton, Great Meadows, and Wallkill State Prisons. Attica Prison receives about 25 per cent of the total number of direct admissions, and Clinton Prison about 5 per cent. Auburn, Great Meadows, and Wallkill State Prisons are strictly "transfer" institutions and receive all of their inmates from other prisons. There are occasional transfers of inmates from one "transfer" prison to another for various reasons. Therefore, it is obvious that unless all the institutions operating within this system maintained the same standards, the benefits of a diagnostic appraisal and decision as to the need for therapy accorded to an individual with syphilis at one prison might be lost when the patient was transferred to another.

In view of the above, a centralized system was visualized whereby through

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the coöperation of the various state prisons the care and treatment of an individual with syphilis would be adequately determined upon his entrance into the state penal system and continued in effect despite transfers from one institution to another. Also, the favorable results obtained by the re-evaluation of the records at Sing Sing Prison suggested that a similar approach might be made to the problem of syphilis at other institutions of the New York State Department of Correction. By these procedures, not only would improved methods of diagnosis and treatment be extended to additional large groups of syphilitic inmates but the combination of their records with those of the Sing Sing Prison patients would form a huge reservoir of statistical data.

#### PRELIMINARY SURVEY

In November, 1941, a meeting was held with the chief physicians of the various state institutions to discuss the creation of a uniform syphilis control program for the New York State Department of Correction. In the following month a field survey of the several institutions was made to determine the extent of their facilities, their personnel, and their methods for the care of inmates with syphilis. In general the findings paralleled the situation existing at Sing Sing Prison prior to the latter's inauguration of its syphilis program. A summary of these findings follows:

1. Little attention was paid to an evaluation of the many factors relating to the disease in each inmate with syphilis.

2. Patients were treated in large groups under rule-of-thumb regimes. With one exception, treatment was given in interrupted courses with intervals as long as, or longer than, the course. The schedule differed at each institution.

3. Little attention was paid to previous therapy. Too much reliance was placed upon the results of the Wassermann reaction of the

blood in guiding treatment. In some institutions, patients were continued on therapy for 5 or 10 years as long as the serology was positive, whereas inadequately treated patients were taken off therapy because of a reversal of the serologic test.

4. Spinal fluid analyses were not obtained routinely on all inmates with syphilis, except in one institution.

5. Chest roentgenograms were not obtained on late cases of syphilis.

6. Methods for the periodic observation of patients with syphilis were inadequate.

7. No facilities were available for the administration of fever therapy for neurosyphilis.

8. The physicians-in-charge were eager to coöperate in a plan designed to provide effective and adequate treatment of their patients.

#### THE SYPHILIS CONTROL PROGRAM

With the field thus surveyed a Syphilis Control Program for the New York State Department of Correction was formulated and launched in January, 1942. The central focus was designated the Syphilis Control Office (S.C.O.), and was located at Sing Sing Prison because of the position of the latter as the chief reception depot and because of its adequate facilities for diagnostic procedures and for the administration of special therapeutic regimes.

The functioning of the Syphilis Control Office can be summarized as follows:

1. *Review of current cases*—Each prison physician sent to the S.C.O. a copy of the record of every syphilitic inmate in his institution. These records were complete in regard to history, physical examination, laboratory tests, and treatment. The charts were reviewed by the staff members of the S.C.O. and suggestions were made as to any further work-up or treatment which might be indicated. These suggestions were then forwarded to the prison physicians.

2. *Admission of new patients*—All inmates admitted to Sing Sing Prison are interviewed as to a history of syphilitic manifestations, positive serologic tests, or antiluetic therapy. All patients giving a positive history, or showing syphilitic manifestations, or upon whom positive serologic tests are obtained in the routine examinations, are admitted to the Sing Sing Prison Syphilis Clinic. Complete



history and physical examination are then performed. Attempts are made to confirm all positive histories of syphilitic manifestations and treatment by correspondence with the medical authorities who previously cared for the individuals. Laboratory work-up includes quantitative complement-fixation tests determined by the New York State Department of Health, Division of Laboratories, complete spinal fluid analyses, teleroentgenograms of the chest and electrocardiograms. The S.C.O. then makes a decision as to the future course of the individual. In general, there are 3 groups of patients: (a) those who are to receive no further antisyphilitic therapy; (b) those who are to receive routine therapy consisting of continuous, alternating courses of a trivalent arsenical and bismuth; and (c) those who are to receive special forms of treatment such as fever and intensive methods of arsenotherapy. The individuals of the first two groups are then eligible for transfer to other institutions, but members of the third group are eligible for transfer only after the completion of the special forms of treatment.

The physician in charge of each of the other "receiving" institutions carries out investigations similar to those of the Syphilis Clinic at Sing Sing Prison. He makes a decision as to each inmate's future course. A copy of the chart is then submitted to the S.C.O. for its appraisal.

3. *Transfer of patients*—When an inmate with syphilis is transferred from Sing Sing Prison to a cooperating institution, the S.C.O. forwards copies of his records. The prison physician is requested to continue the courses specified for each individual. The necessary follow-up examinations are indicated. It is requested that no changes be made in the regime prescribed by the S.C.O. or other admitting office before such is brought to the attention of, and is approved by, the S.C.O. and corrections made on its own records.

Upon the transfer of an inmate with syphilis from one cooperating institution to another, the transferring institution sends to the S.C.O. a notification of that fact together with its completed case records. The S.C.O. then forwards to the receiving prison a copy of these records including its suggestions as to the future course of the individual.

4. *Rôle of the cooperating physicians*—The functions of the prison physicians are as follows:

- a. Performance of history and physical examination on admission and a repetition of the latter twice yearly.
- b. Administration of routine treatment.

c. Performance of serologic tests (titered by New York State Department of Health, Division of Laboratories) twice yearly and of lumbar punctures and chest roentgenograms where indicated.

d. Keeping of adequate records in uniformity with all cooperating institutions.

5. *Parole or discharge of inmates*—When an inmate with syphilis is to be discharged by expiration of his sentence, the cooperating institution sends to the S.C.O. one complete clinical record including final suggestions as to the future needs of the individual. When the patient is released on parole, a copy is also sent to the parole officer. If further therapy or follow-up is indicated, the parole officer assigns the patient to an appropriate clinic and supplies that clinic with the record.

6. *Consultation service*—At least twice yearly, a staff member of the S.C.O. visits each of the cooperating institutions for the purpose of discussing problems and consulting about difficult cases. Visits may be made more frequently should the occasion arise.

7. *Handling of neurosyphilitic inmates*—The majority of patients with syphilis of the central nervous system are diagnosed on admission to Sing Sing Prison by clinical means or by spinal fluid analysis and are kept at that institution so that especially indicated forms of treatment may be administered. When such therapy has been completed, these patients may be transferred to other institutions.

When inmates with central nervous system syphilis are admitted directly to other institutions, or are first discovered at other prisons, arrangements are made to have these individuals transferred to Sing Sing Prison because of the therapeutic facilities there available. Upon the completion of therapy, the patient may be re-transferred to the original institution for follow-up.

8. *Establishment of the Central File*—The Syphilis Control Office established a Central File to serve as a collective reservoir for all information related to inmates with syphilis within the cooperating institutions. This file was begun with the records which were submitted to the S.C.O. for appraisal in the original review of current cases. Records of newly admitted patients are added when the diagnostic procedures are completed and the therapeutic regimes outlined. The charts are kept current by the addition of related correspondence, progress reports by the cooperating physicians, and the notations of the S.C.O. consultant at the time of his periodic visit to the institutions. When an inmate leaves an institution, the prison physician

sends to the S.C.O. a report which includes all information not previously recorded in the Central File and a statement relative to the future course of that individual. When an inmate is transferred from one cooperating institution to another, this fact is noted on the file of both prisons.

#### PROGRESS

In the six months which have elapsed since the inauguration of the program, considerable progress has been made. Five other institutions of the New York State Department of Correction have joined with Sing Sing Prison in establishing uniform methods for the care of inmates with syphilis under the supervision of the Syphilis Control Office.

The records of 942 patients from these 5 institutions have been brought up-to-date by the prison physicians and reviewed by the S.C.O. staff, as had previously been done with the records of inmates with syphilis at Sing Sing Prison. Seventy-five patients have been seen in consultation during a visit of an S.C.O. staff member to these institutions. Many inmates with late syphilis are having chest roentgenograms and spinal fluid analyses for the first time. The application of definite criteria for the determination of the adequacy of previous therapy has resulted in a reduction in the percentage of patients under treatment from 72.5 per cent to 19.3 per cent. Fifteen cases of active neurosyphilis were found which were previously undiscovered or were being unsuccessfully treated by routine methods over long periods. These inmates have been transferred to Sing Sing Prison for fever therapy.

The Central File now contains records of 1,502 current cases of syphilis under the supervision of the Syphilis Control Office of the New York State Department of Correction. This number includes 560 cases at Sing Sing Prison plus those of the 5 cooperating institutions. The records in this file

are kept up-to-date through notifications by the prison physicians as to changes in regime, transfer, or discharge of any patient.

#### DISCUSSION

The Syphilis Control Program has been launched primarily to permit the several large institutions of the New York State Department of Correction to cooperate in maintaining uniform standards in the treatment of the syphilitic inmates under their control, thereby insuring effective and sufficient treatment. The advantages of incarceration for an extended period within a single institution in allowing for the administration of adequate antiluetic therapy has previously been demonstrated.<sup>2</sup> The Syphilis Control Program brings the same advantages to all syphilitic inmates within the state penal system, including those who for various administrative reasons are subjected to one or more transfers. The syphilitic inmate now has the advantage of an initial complete diagnostic appraisal by physicians particularly interested in syphilis, and consultation by these physicians as need arises. The proper handling of the syphilitic during his period of incarceration results in an individual with much more confidence regarding his future and also precludes him from being added to the problem of syphilis and its complications among the general public when he is released.

The pooling of scientifically collected facts concerning these many syphilitics in the Central File should create a reservoir which later will bring forth much information and fill many gaps concerning current knowledge of the disease. As the average period of incarceration within a state prison is 2 years, and many serve sentences for 10 years or more, while others return because of violation of parole or new offenses, the chances appear unusually good for obtaining long term observations upon

these individuals. With an active case load of 1,500, and approximately 500 added yearly, the number of cases followed for long periods should be sufficient to allow us to draw conclusions of statistical significance. It is hoped that with the passage of years, answers can be found to such questions as the indications for therapy in latent syphilis, the differences in final outcome between untreated, inadequately treated, and adequately treated patients, the differences between adequate treatment early and late in the course of the disease, and finally an evaluation of the newer intensive methods of therapy.

#### SUMMARY

1. A centralized program for the care of syphilitic inmates in the various New York State penal institutions has been described.

2. By means of such a program, all

syphilitic inmates can be assured of adequate therapy during their periods of incarceration.

3. The establishment of a central file with records of 1,500 active cases, many of whom will be followed over long periods of time, may eventually yield a considerable amount of useful information regarding the course of syphilis.

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# Efficacy of Standard Purification Methods in Removing Poliomyelitis Virus from Water\*

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THE presence of poliomyelitis virus in feces of persons ill with the disease was first demonstrated almost thirty years ago<sup>1</sup> and has been verified many times in the last few years.<sup>2, 3</sup> The presence of poliomyelitis virus in feces indicated that sewage might become contaminated with the virus and the possibility arose that the virus might persist in sewage for a considerable period of time—hypotheses demonstrated recently by several workers to be facts.<sup>4, 5</sup> The gastrointestinal portal of entry, long maintained by Toomey<sup>6</sup> and recently substantiated by others,<sup>7</sup> would suggest that any substance that contained active virus taken through the mouth might be a hazard to the individual. It is quite possible that water could become contaminated secondarily from sewage and the virus thus find its way back to the intestinal mucosa. The viability of poliomyelitis virus in sterile water stored in the dark has been found to be over 100 days,<sup>8</sup> and it has further been shown that chlorination by present-day methods<sup>9, 10</sup> is of little value in the destruction of the virus. These observations point further to the

potential hazard of water as a possible means of transmission of poliomyelitis virus, although water cannot be at present incriminated as a transmitter of the disease.<sup>11</sup>

The studies here reported have been undertaken to see if methods commonly employed in water purification plants will remove poliomyelitis virus from water which has been artificially contaminated with it. The investigation of the effects of the chemical and physical methods used in water purification were approached under the following headings: Storage, Sedimentation, Sand Filtration, Hydrogen ion Range, Charcoal Adsorption, and Ultra-violet Irradiation.

## METHODS

*General*—A neurotropic virus, apparently an adapted poliomyelitis strain pathogenic for mice, was used throughout the experiments. Inoculations were made intracerebrally in amounts of 0.03 ml., and were made immediately after the removal by aseptic procedure of samples of the materials under investigation. The virus dilution used was 1:500 unless otherwise stated. Control groups of mice were included for each phase of the study. The control groups

\* This study was aided by a grant from the National Foundation for Infantile Paralysis, Inc.

received the virus in the same quantity and by the same route as the test animals. All mice were observed at least once daily for paralysis or other evidences of illness. Two strains of mice were used in the experiments: University Hospital Strain and Webster Strain of white Swiss mice. The animals used were 3 to 4 weeks of age. All groups were observed for a period of 30 to 40 days following the inoculations before the protocol was completed. To obtain the original virus suspension, mice paralyzed in two or more extremities were sacrificed and their cords and brains removed. These were ground up in refined silica and suspended in broth or saline. After centrifugation at moderate speed for 5 minutes, the supernatant was removed and used as the virus concentrate. This was a 1:5 suspension of brain and cord. A fraction of each stock lot was frozen and stored in dry ice in a deep freeze unit for later use.

*Couglution and Sedimentation*—Battery jars to which city water or raw untreated water was added were used for sedimentation tests. Lime and alum were added to city water to obtain the floc, while only alum was used in the raw water. By varying the amount of lime added, variations in pH of 6.3, 6.7, and 7.0 were obtained. In water purification plants, raw waters are treated at different pH's, and by using these three we tried to approximate the pH range in standard use. To samples of city water, 100, 120, and 140 p.p.m. of lime were added and 100 p.p.m. of alum. In the raw untreated water, only 100 p.p.m. of alum were used. Fuller's earth, 100 p.p.m., was added to some samples of city water to increase particulate matter to the point of turbidity.

After the chemicals were mixed into the water, the virus was added and the water containing the virus and chemicals was then slowly stirred for 20 to 30 min. The sedimentation jar was

then placed in a refrigerator for 2 to 3½ hrs. to allow the alum floc to settle. Refrigeration was found necessary, otherwise the air dissolved in the water tended to carry portions of the floc to the surface. After the settling period, samples were removed aseptically for injection into the animals. Twenty-four hour samples were also taken several times, as it was thought that minute invisible particles of floc might still be settling at the end of the shorter holding period.

*Filtration*—A model laboratory sand filter was made with a glass tube, 2½" in diameter and 4' in length. Ottawa filter sand, having an effective size of 0.508 and a uniformity coefficient of 1.24, was placed in the tube to a height of 30", the bottom of the tube being occluded by a carborundum block 1¼" in height, to supplant the gravel used in filtration beds. A constant flow apparatus was installed to furnish a constant head to the sand filter. The details of this apparatus are shown in Figure 1.

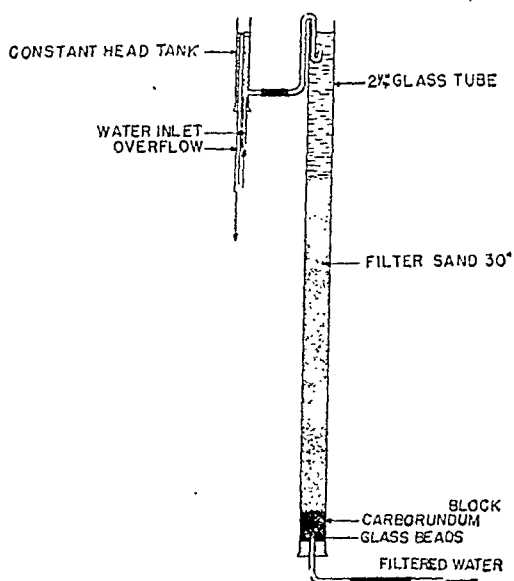


FIGURE 1—Model of the Laboratory Flow Sand Filter

With the constant head maintained over the sand filter, the virus suspension could be added to the top of the filter without any change taking place in rate of flow. Samples of filtered water were collected at varying intervals from the bottom of the filter. Virus suspension was added at the top of the sand filter, both with and without alum floc impregnated in the upper layers of sand.

The flow of water maintained through the sand filter was 144 ml. per minute, calculated on the basis of 125 m.g.d. per acre, which is standard water plant practice. This rate of flow could be maintained by regulating the petcocks between the filter and constant flow apparatus and those at the bottom of the filter. A further check on the speed of flow through the sand filter was obtained by adding fluorescein dye (1:1,250,000) at the same time the virus was added and beginning the collection of samples at the first appearance of the color in the filtered water.

**Activated Charcoal**—Activated charcoal (Cliffchar Activated Carbon-R. Fine, 30 Phenol Value, Dow Chemical Co.) was suspended in concentrations of 10, 25, and 50 p.p.m. in tap water and thoroughly mixed before the virus was added. The carbon-virus mixture was then slowly agitated for 20 to 30 min. and allowed to settle for approximately  $3\frac{1}{2}$  hrs. After the settling period, samples of the supernatant were taken for injections into the test group of animals.

**Storage**—Virus suspension was added to 50 ml. samples of tap water in sterile bottles and stored at refrigerator temperature. Samples for injection into animals were removed from the stored water, to which virus had been added, at intervals varying from 1 hr. to 100 days.

**Irradiation**—Direct sunlight and irradiation from ultra-violet lamps (General Electric and Westinghouse tubes) were used as the sources of rays.

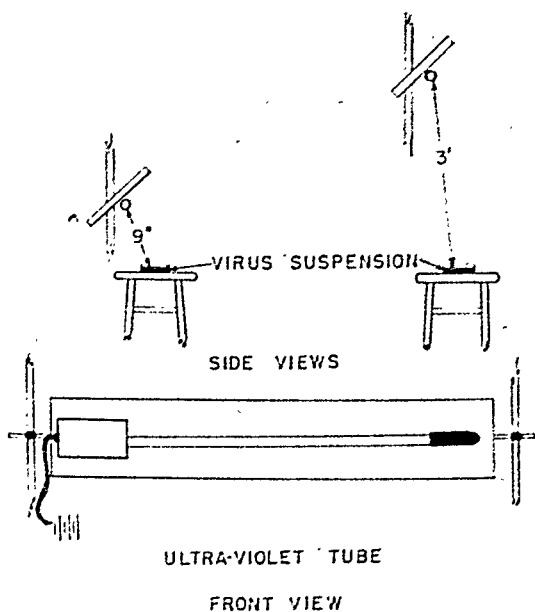


FIGURE 2—Methods of Exposing Virus Suspension to Ultra-violet Irradiation

Both Toomey<sup>12</sup> and Jungeblut<sup>13</sup> have reported effectiveness of ultra-violet irradiation in the destruction of poliomyelitis virus. The methods employed in our studies were similar to those described by Toomey,<sup>12</sup> except that larger quantities of virus and greater depths of material were used, as well as greater distances from the source of radiation. Figure 2 is a diagrammatic sketch of the apparatus in relation to the source of light.

The virus suspension in 1:100 dilution was exposed in uncovered glass dishes to the source of irradiation. In one experiment the distance from the light was 9" and the depth of the suspension in the dishes was  $\frac{5}{16}$ ". In another experiment the source of radiation was 3' from the virus suspension, which was  $\frac{1}{2}$ " in depth. In a third experiment the distance was 12" and the virus suspension  $2\frac{1}{2}$ " in depth. In tests of direct sunlight the virus suspension was  $\frac{1}{2}$ " in depth. Samples were taken at 5, 10, 15, 25, and 30 min. intervals in the first experiment and at 5, 15, and 30 min. intervals in the later experiments.

**Aeration**—Air at room temperature

was allowed to bubble through a 1:100 virus suspension for 45 min. Samples for injection were taken at 30 and 45 min. In making these experiments 25 ml. of virus suspension were placed in a side-arm test tube to which a suction pump was attached. Room air was drawn to the bottom of the suspension through a tube so that all portions of the suspension were well agitated by the passage of air.

*Hydrogen ion Range*—Virus suspensions in 0.5 ml. amounts were added to 9.5 ml. of buffered solutions of a pH range from 4.0 to 8.5. All were placed in the refrigerator for 1 hr. and were then neutralized to a pH of 7.0 and samples were taken for injection.

The pH of each sample was determined colorimetrically and was checked in the Beckman pH Meter; the pH after addition of the virus suspension, compared with the pH of the buffered solution, is shown in Table 1.

TABLE 1

pH Buffer Solution	Buffer and Virus Suspension
4.0	3.57
4.5	4.12
5.0	5.25
5.5	5.68
6.0	6.03
6.5	6.33
7.0	6.68
7.5	7.36
8.0	7.58
8.5	7.99

## RESULTS

*General*—The appearance of paralysis in one or more mice in a test group was taken as an indication that virus persisted in the water sample under investigation and was viewed as evidence that the method of water purification employed on the particular sample, when reduced to laboratory scale, was unsuccessful in removing completely or inactivating completely the mouse-adapted poliomyelitis virus. In many cases mice died without paralysis of the extremities being observed. These animals have been segregated in the tabu-

lation of results even though mice in a virus-injected group, dying after one or more of the group were paralyzed, might be counted as deaths from the virus infection, because respiratory paralysis may occur in such animals before the extremities become involved.

*Coagulation and Sedimentation*—Paralysis developed in one or more mice of each group that received virus suspension subjected to coagulation and sedimentation procedures. However, the percentage of animals developing paralysis was usually not as high as in the control groups of animals which received untreated virus of the same dilution.

Thus, alum flocculation and sedimentation appeared to cause a slight reduction of the total amount of virus in any suspension, the amount of reduction being apparently proportional to the amount of virus present.

In the results shown in Table 2, the groups of animals which had received water of different pH's were not separated but were included under their respective headings of turbid, clear, or raw water, as it was found that variations of pH as used in this experiment did not affect the results. Rather, to interpolate here the results of the larger experiment on the effect of pH, it was found that this neurotropic virus withstood a pH range of 3.5 to 8.0, as shown in the ability of the virus to produce disease in animals after exposure to such variations in reaction for periods of 1 hr., but with neutralization to pH 7.0 before inoculation.

As shown in Table 2, 132 mice received water (containing virus) that had been treated with lime and alum. Of these, 56 mice died after developing paralysis, 25 died without paralysis being observed, and 51 were alive at the end of the experiments. In the control group 48 mice were injected with virus suspended in water but not treated with lime and alum; 28 animals were ob-

TABLE 2

*Effect of Sedimentation and Coagulation in Removal of Virus*

Number of Mice	Water	Virus Dilution	Number Paralyzed	Number Dead	Discards	Miscellaneous
18	Clear	1:1,000	7	4	7	3½ hr. settling
18	Turbid	1:1,000	5	5	3	3½ hr. settling
12	Control	1:1,000	5	6	1	Untreated water
6		1:5	6	..	..	Original suspension
18	Clear	1:100	4	5	9	Very fine alum floc particles
6	Control	1:100	3	1	2	Untreated water
18	Turbid	1:500	5	5	8	2 hr. settling
18	Clear	1:500	12	3	3	2 hr. settling
12	Control	1:500	9	1	2	Untreated water
6		1:5	3	2	1	Original suspension
18	Turbid	1:500	10	..	8	24 hrs. settling
18	Clear	1:500	9	3	6	24 hrs. settling
12	Control	1:500	5	2	5	Untreated water
6		1:5	4	2	..	Original suspension
6	Raw *	1:500	4	..	2	3 hrs. settling
6	Control	1:500	6	..	..	Untreated water
6		1:5	6	..	..	Original suspension

\* Alum used only

served to have paralysis, 10 died without paralysis being observed, and 10 were alive at the end of the experiments. Of the control animals inoculated with the original virus suspension, 25 of 30 mice succumbed after developing paralysis, 4 died without paralysis, and 1 animal survived.

*Filtration*—The results of the sand filtration experiments are shown in Table 3. A sample was taken when fluorescein dye first appeared at the outlet of the filter and at 1 min. intervals thereafter until the disappearance of the color. Six mice were used for each sample taken and eight or nine samples were taken on each experiment.

When sand filtration alone was used, 29 of the 60 mice inoculated with the filtered water became paralyzed. Apparently alone, the sand filtration held back little of the virus. In a later experiment, large quantities of alum floc were allowed to impregnate the surface layers of the filter, reducing the rate of flow from 144 ml. per min. to 102 ml. per min., or to approximately 65 per cent of the standard rate of flow. The results of this experiment were quite at variance with those found in the earlier experiments where sand filtration alone or alum precipitation alone was used. Of 54 mice receiving virus in water thus filtered through a partially blocked

TABLE 3

*Effect of Sand Filtration in Removal of Virus*

Number of Mice	Virus Dilution	Filter Substance	Number Paralyzed	No. Dead without Paralysis	Discards	Miscellaneous
30	1:500	Sand	15	5	10	48 hrs. of water through filter
6	1:500		3	1	2	Nonfiltered suspension
6	1:5		4	2	..	Original suspension
6			..	..	6	Tap water—no virus
30	1:500	Sand	14	5	11	Well seeded filter
6	1:500		1	1	4	New filtered suspension
6	1:5		4	2	..	Original suspension
54	1:500	Sand and alum floc	1 *	1	52	Excessive amount of floc on filter
6	1:500		4	2	..	Nonfiltered water and virus
6	1:5		6	..	..	Original suspension
30	1:500	Sand and alum	15	..	15	No virus in 6 minute sample
6	1:500		5	..	1	Nonfiltered water and virus
6	1:5		4	2	..	Original suspension

\* Questionable paralysis with death in two days



sand filter, only 1 animal developed paralysis. In this one case the paralysis was less extensive than in most of the control mice. Control groups of mice injected with the original virus suspension and the diluted suspension came down with paralysis in numbers as in the previous experiment, confirming the fact that virus was present and active. That a rather large accumulation of alum floc on the filter was necessary to hold back the virus was shown in the next experiment in which alum floc, layered approximately  $\frac{1}{8}$ " thick on the surface of the sand filter, failed to hold back the virus. Thirty mice were injected with water to which virus had been added before passage of the mixture through the filter so covered with a layer of alum floc. Of these, 50 per cent were observed to develop paralysis. The control groups of mice injected with the original and diluted virus suspensions gave higher percentages of takes.

When the filter sand was backwashed, large amounts of alum floc were released from this sand. This was an indication that the floc had penetrated into the sand bed.

*Activated Charcoal*—Attempts to remove virus from water by adsorption on activated charcoal in the concentrations tested (10, 25, and 50 p.p.m.) were partially successful. There seemed to be adsorption of the virus particles on the charcoal, as the numbers of mice which became paralyzed when inoculated with water so treated were less than those in the control groups inoculated with a similar virus suspension not exposed to charcoal.

The partial adsorption of the virus on charcoal was further demonstrated. The settled charcoal particles were injected intracerebrally into mice, and induced paralysis in a high percentage of animals, indicating that adsorption on higher concentrations of charcoal might be a means of concentrating the

virus sufficiently for detection from a suspension in which it was suspected of being present in high dilution.

*Ultra-violet Irradiation*—The results of our first experiment with ultra-violet irradiation in which the light distance was 9", the depth of the virus suspension  $\frac{5}{16}$ ", the dilution 1:300, and 30 ml. the total suspension used were similar to results reported by Jungeblut<sup>11</sup> and Toomey.<sup>12</sup> One mouse became paralyzed in the group which received the virus exposed to ultra-violet light for 5 min. while in the groups inoculated with suspension exposed for 10, 15, and 25 min., no animals developed paralysis. The usual numbers of animals in the control groups injected with untreated virus suspension became paralyzed.

In further experiments the amount and depth of virus suspension and the distance from the light were varied. Thus, in one experiment 600 ml. of a 1:300 dilution of virus suspension  $2\frac{1}{2}$ " in depth was exposed to ultra-violet light 9" from the source of the light. This was to determine the effect of light at greater depth of material. In another experiment 60 ml. of 1:300 dilution  $\frac{1}{2}$ " in depth were exposed at the distance of 3' in indicate the effect on the virus of increased distance from the source of light. Samples were removed from the bottom of the virus suspension by syringe and needle, care being taken not to agitate the liquid during the period of exposure.

In each experiment specimens were taken at 5, 15, and 30 minutes. Two animals died without paralysis in the series where the virus suspension was  $2\frac{1}{2}$ " deep. These animals were in the group where virus suspension was exposed for 15 min. to ultra-violet irradiation. The virus suspension exposed only 5 min. 3' from the source of radiation caused paralysis in one mouse. Thus, only 3 animals of the 36 used in irradiation experiments became paralyzed or died, while all but one of the

18 animals used in the control groups which received the untreated virus in 1:300 dilutions became paralyzed.

Direct summer sunlight did not, on the other hand, appear to have an equal effect on the virus. Some of the mice in each group of 6 inoculated with virus suspension, after exposure for 5, 15, or 30 min. to direct sunlight, succumbed with paralysis. As this virus suspension was exposed to direct sunlight in  $\frac{1}{2}$ " depth, the results indicated a definitely superior effect of the ultra-violet irradiation from artificial sources.

**Storage**—Virus has remained viable stored in tap water at refrigerator temperature for as long as 100 days. Of 90 mice receiving the stored water containing the virus for this length of time, 38 were observed to develop paralysis. This includes two groups of 6 mice in which none became paralyzed, indicating that the virus had died in these two lots of water. In all other groups, 2 or more mice were observed to develop paralysis. In the control groups of mice, injected with the original and the diluted virus, all mice but 1 succumbed with paralysis, while in the water-control group not receiving virus but water alone, all animals remained alive.

**Aeration**—Aeration for 30 and 45 min. of a 1:100 dilution of virus in tap water had little apparent effect on the virus. All the mice in two groups inoculated with aerated water succumbed after developing paralysis.

**NOTE:** It is to be noted that this study on the efficacy of water plant operations on the removal of poliomyelitis virus from artificially and heavily contaminated water is in no way a quantitative measure of the effectiveness of these methods. Quantitative variations in technic and combinations of the methods of

control must be employed before definite conclusions may be drawn. In this report no attempt has been made to show the lack of effect of chlorination on poliomyelitis virus as others<sup>9</sup> have shown that present chlorine residuals in drinking water are not sufficient to destroy virus.

#### SUMMARY

The methods of water purification commonly employed, namely coagulation and sedimentation, sand filtration, adsorption on activated charcoal, aeration, adjustment of pH and storage, have failed when tested individually to remove completely poliomyelitis virus from artificially heavily contaminated water. Results of this study indicate that ultra-violet irradiation from artificial sources has an effect on the destruction of the virus in water greater than that exerted by direct sunlight, and is more effective in inactivating or destroying virus suspended in water than any single purification method commonly utilized.

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# The Improvement of Local Housing Regulation Under the Law

## An Exploration of Essential Principles\*

### THE NEED FOR REEXAMINATION OF HOUSING CONTROLS

#### *Objectives of the Committee's Study—*

The public health elements of housing have come increasingly to be recognized as essential parts of the housing problem. The world-wide movement for adequate shelter is justified primarily by the demand for living conditions which are compatible with physical and emotional health.

For generations the law has recognized the right of public health authorities to act for the improvement of housing conditions, and many health officers have made substantial contributions to the control of this problem through law enforcement. Accomplishments in this direction, however, have necessarily been limited. Families do not live in slums by preference or by chance. Except in rare instances, they live there because they are poor. The demolition of bad houses where there are no good ones at a rent which can be paid by the slum dweller, or the requirement of structural alterations which cannot be economically justified, may deteriorate rather than improve the total community situation.

With the development of government-assisted programs of slum clearance and low-rent housing, conditions have radically changed. Though such enterprises are now necessarily interrupted by the war, they must be resumed on a greater scale in connection with post-war plan-

ning for reemployment and reconstruction. As this occurs, it will be possible in increasing degree to proceed with the elimination of substandard dwellings. The hands of the health officer and of the fire and building inspector will be freed to accomplish results hitherto unattainable. Furthermore, rehabilitation and slum elimination carried out in cooperation with local housing authorities may be so organized as to contribute materially to sound and constructive community planning. In addition, it is essential that the clearance of slums and construction of new housing through public subsidy be supplemented by regulations that are adequate and enforced to prevent the development of more slums due to the absence of proper control over new residential construction.

The present codes and laws which deal with substandard dwellings are generally inadequate, and the machinery of administrative control wasteful and chaotic. There is a valuable opportunity at the present time to study rational and constructive approaches to the problems of legal control of substandard housing.

The Committee on the Hygiene of Housing has received numerous requests from local and state officials for advice on the drafting or revision of housing regulations; and the companion Committee on Housing of the Health Officers Section of the Association has recently been in correspondence with over forty health officers in regard to this and related problems. No adequate solution can be obtained by a scissors-and-paste adaptation of existing laws. The whole

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\* Report of the Subcommittee on Housing Regulation, of the Committee on the Hygiene of Housing, Committee on Research and Standards.

problem must be thoroughly studied from a fundamental viewpoint, with special reference to the powers which are delegated to the health officer for the framing of regulations.

The present memorandum is a preliminary exploration of this important field. Later releases of the committee are planned to review significant practical experience, both under the usual forms of housing regulation and under new types of laws and ordinances; and also to formulate, in so far as practicable, definite quantitative standards, specific administrative and enforcement provisions, and skeleton or model drafts of basic legal instruments.

It is obviously impossible to consider the housing responsibilities of health departments alone, for they interlock at many points with those of other agencies. In its first exploration of the problem, therefore, the committee conducted extensive correspondence with health, building, and housing officials throughout the United States, and with leading unofficial housing agencies, to canvass their opinion and experience as to the most feasible types of housing control.<sup>1</sup>

Two viewpoints were outstanding in the replies received. First, that mere amendment of building codes as we now know them is not a practicable means of establishing the necessary standards for future housing construction, primarily because these codes are concerned mainly with the structural adequacy of buildings in general, and only to a minor degree with the healthfulness and livability of dwellings. The drafters of building codes, while prescribing, as they must, for a diversity of structure-types, have seldom attempted to cover the full range of essential housing standards which derive from broad considerations of healthfulness and well-being in the home. This conclusion in some form was the one most generally advanced in support of a new type of comprehensive

housing code, which should include at least the dwelling provisions of the building and related codes, but should cover a considerably wider range than these traditional documents.

The second striking feature of the correspondence was the wide agreement that public health officials should begin to assume real leadership and responsibility in developing control of conditions in existing dwellings, and that health department responsibility for occupied housing should be clearly recognized in any future type of housing regulation, whatever the division of responsibility for new construction. This does not mean that the health department must necessarily enforce such regulations in every community, but that when it does not itself enforce them it should accept its responsibility for seeing that they are enforced, to the point if necessary of insisting that it be given this power and authority.

These views have strongly influenced the committee, and they form the point of departure for the present memorandum. This first statement has also been influenced by the committee's critical study of the composite structure of state and local housing regulations in the State of Connecticut, made in coöperation with the new Housing Division of the Connecticut Department of Health, during which many elements of confusion and weakness in the typical pattern of housing regulation were clearly revealed.

Special attention will be given here to the regulation of existing housing, not only because of its basic significance to health departments and their possible future housing programs, but because of its peculiar importance during the war. Since the war is bringing virtual cessation of normal building as well as of the public housing program, it will necessarily prolong the use of substandard or marginal dwellings everywhere. In centers of war activity it is also increasing

the burden of overcrowding. In some such areas it is causing pressure for considerable increases in dwelling capacities by the conversion of large dwelling units into small ones. Regulatory powers must therefore be made effective both in order to conserve needed structures generally and to control special wartime problems of occupancy and alterations. Furthermore, in some localities the war is producing temporary housing that should be removed when the crisis ends, and local authority may be necessary to bring this about.

*The Pattern of Housing Regulation*—Adequate control of housing from the viewpoint of public health requires many forms of protection: the adoption and enforcement of health, safety, and amenity standards for new dwellings of both single- and multi-family types, including their environment; the development and enforcement of standards of maintenance and occupancy for existing family dwellings; the treatment of peculiar problems (both as to initial character and operation) of special dwelling facilities such as lodging houses, trailer camps, hotels, and dormitories; and the extension of suitable controls to the built-up areas beyond the corporate limits of cities so as to preclude the development or continuance there of slums. In addition, the protection of rural housing has received little attention. It presents a challenging problem that must receive careful study. It cannot be forever neglected.

The usual instruments for local housing regulation are of several types. The construction of new buildings is commonly governed by codes and ordinances forming part of the state or local organic law, enforced by building, zoning, and fire departments. The health status of the occupants of existing dwellings may be protected either by similar ordinances or by health department regulations having the force of law, but authority in the latter case is often limited to

certain classes of dwellings such as tenements and lodging houses; single- and two-family dwellings are commonly unregulated as to conditions of occupancy except where fire hazards or public nuisances are involved.

Among the traditional instruments for housing regulation the local building code is, generally speaking, the most elaborately developed. It is, however, largely restricted to new construction and, as previously noted, must cover many types of structures in addition to dwellings. Zoning ordinances deal with land coverage and segregation of alien uses from dwelling areas, but they do not affect existing structures. They are often weakened by their preoccupation with the problems of business areas and the preservation of single-family districts, or by indiscriminating grants of variance. Frequently their standards are too low to prevent congestion of buildings on the land. The maintenance of existing dwellings is sketchily dealt with—if at all—in building construction codes; health and fire department regulations may contain additional provisions on upkeep, services, and occupancy, but seldom are these regulations for existing dwellings either complete or conveniently accessible *in toto*. Exceptions do exist, but they are rare. The creation and operation of lodging houses, trailer camps, or other special dwelling types are often covered by special laws or ordinances, but here as in other fields of regulation the controls are likely to be based on models borrowed from other communities rather than upon discerning study of local problems. Suburban areas commonly have only partial controls. Rural districts usually lack them altogether, or may be saddled with statewide regulations which are meaningless in the absence of machinery for enforcement.

The composite effect of these various types of regulations that exist in most communities is anything but orderly or

clear, and the practical results of the confusion are extremely serious. Housing provisions may be generally unknown and unenforced, in part because they are lost in chaotic documents. Health, building, and fire departments may operate each in ignorance of the others' activities, if not in fact of their responsibilities. Inspection is divided and may be sporadic and wasteful of manpower. Broad powers, loosely worded, may hamper enforcement through the officials' fear of personal liability. In times of housing surplus unfit dwellings are not destroyed, as they might often be by the exercise of clearly existing powers; in times of shortage they may be occupied with no proper regulation in terms of special maintenance required. Both the layman and the courts are more likely than not to be ignorant as to what comprises existing housing regulation, and many an important test case may escape prosecution or be settled to the detriment of the community as the result of nothing more sinister than the prevalence of sheer confusion.

Numerous cities and several of the states, in an attempt to deal with these problems, have adopted housing codes which aim to provide more or less coordinated regulation. Four noteworthy types of controls developed in recent years will be analyzed in this and later studies of the committee:

1. General housing laws such as those of Michigan and Iowa (based on Lawrence Veiller's model housing law of 1920). These deal with both construction and upkeep of single- and multi-family dwellings, usually in cities above a certain size. Such laws may provide for incorporating the pertinent sections of the local building code, but they set forth additional requirements on such matters as sanitary facilities, required space, lighting, heating, and repair. Such acts may define the responsibility of building, health, and fire departments; in some states they authorize the

creation of a special housing-enforcement official. (Twelve states are known to have enacted housing statutes, but the majority of these are the old-line type of tenement-house regulation.)

2. Comprehensive local codes which incorporate the essential features of general housing laws (such as discussed in 1).

3. Special laws or ordinances, defining unsafe or substandard dwellings, and prescribing remedies through repair, abatement, closure, or demolition. These have been adopted in a number of states and cities, in an attempt to control the most flagrant conditions in existing dwellings.

4. Enabling acts which omit specific regulations but delegate the power of drafting these to a local officer or commission. This type of control is a recent and promising development which will be considered in some detail later in the present statement.

#### THE LEGAL BASIS OF HOUSING REGULATION

If broad and constructive results are to be attained, well defined powers must be placed in the hands of appropriate enforcing authorities. What shall be the basis of these powers?

*General Limits of Protection* — It seems clear, first of all, that the requirement of minimum conditions essential to health and safety should apply to all types of structures used for human habitation. It was natural that multiple dwellings and rooming houses should have received first attention in the development of housing control, since these buildings involve specific problems of manager-maintenance with regard to shared stairways and passages, common sanitary facilities, fire escapes, and the like. Yet regulation must not stop short at this point. There seems no valid reason—either legal or social—why the inhabitants of one-family and two-family houses should not also receive legal

protection, and it is a sign of progress that most of the regulations adopted in recent years have broader coverage than the earlier laws concerned primarily with tenements.

It is sometimes suggested that the regulation of housing should be limited to rented homes; but this distinction seems no more reasonable than one based on the size of the building concerned. The parent has no more vested right to prejudice the health and safety of his own children or his neighbors than the landlord has to work similar injustice on his tenants. The members of a family living in their own home should enjoy modern health protection under the law as much as the members of a family living in a rented dwelling. In some cities owned homes in certain low-grade areas are on the average more dangerous than rented homes. It would clearly be fantastic to clean up a block of rented homes leaving isolated owned dwellings in the same block in a hazardous and insanitary condition. It is recognized, of course, that in some communities psychological factors may restrict the degree to which owned homes can be regulated.

Another possible criterion for limiting the field of operation of a housing code is the size of the community or the density of population in the area concerned. From the standpoint of practical expediency it is obvious that the same standards cannot be enforced for isolated farm houses that are practicable for city tenements. There is even some logical ground for such a distinction, to the extent that dangers of conflagration and of epidemic disease constitute a greater hazard in crowded communities. The distinction is, however, one of degree rather than one of kind.

The committee is therefore of the opinion that within any given homogeneous area there should be substantially uniform legal requirement of appropriate basic essentials for health and safety in

all buildings used for human habitation, irrespective of types of buildings<sup>2</sup> or ownership.

*Regulation of New Construction and of Existing Dwellings*—Historically, in legislative enactments, the control of new building and that of existing houses has usually been kept separate, for two reasons. In the first place, regulations for new construction have commonly been—and must practically be—more rigorous than those for existing dwellings. In the second place, enforcement of the two types of regulations has usually been in different hands. The approval of plans and the inspection of construction have been conducted on established engineering principles by building and fire departments, while the problems of occupancy and maintenance have been dealt with largely by health and fire departments.

From the long-range standpoint of reasonably coördinated local housing policy, such a sharp separation of functions is perhaps unfortunate, but there is no simple universal remedy.

The committee believes that it may be desirable in the long run to combine or coördinate all types of housing regulation in a comprehensive housing code, but it recognizes serious obstacles to such a course in most communities. For immediate purposes, in most places it seems necessary to treat the regulation of new construction and of existing dwellings as separate problems. Although the present statement is chiefly concerned with the problem of existing housing, the committee plans in its future studies to consider and appraise the various possible means for increasing coördination of responsibility in these two fields.

It is believed that real and significant progress can be made in many communities in the immediate future by the following steps: (a) the formulation or revision by the local health department of regulations for existing dwellings, in

order to bring these controls into reasonable conformity with contemporary standards; (b) the compilation of those sections of the building, zoning, fire, or other ordinances and regulations which affect new dwelling construction, and the distribution of these provisions in convenient form not only to builders but to all interested official agencies, including the local health department; (c) a critical study, by official and citizen groups concerned with housing, of the coverage provided by the regulations cited in (a) and (b) above as a basis for developing such integration of housing control as may be locally desirable.

*Direct Statutory Control vs. Rule Making under Delegated Authority*—The next problem to be considered is whether the control of existing dwellings should be in the form of a detailed ordinance enacted by the regular legislative authority of the area or in the form of more flexible regulations promulgated by an expert body or official to whom the task has been delegated by proper legislation. Codes for new construction have generally been of the former type, while the problems of occupied housing—aside from fire department inspection—have been left largely to the local health department. This responsibility has perhaps been more honored in the breach than in the observance.

In connection with maintenance and occupancy standards in existing dwellings, the arguments for control under flexible administrative regulations are very strong. A considerable proportion of such dwellings will necessarily fall below any reasonable standard for new construction, either as a result of:

1. Factors in original construction which cannot be retroactively corrected; or
2. Insanitary, unhygienic, or hazardous conditions due to deterioration, defective maintenance, or improper occupancy.

In dealing with problems of this kind, the clear and specific formulation of detailed ordinances would seem to simplify

enforcement. On the other hand, any standards which can be immediately enforced in a given community will almost invariably fall far below the minima essential for health and safety. There is danger that such low standards, if embodied in ordinances or statutes, will become so crystallized as to halt further progress. A given city, for example, enacts a certain standard for the ratio between the number of dwelling units in a tenement and the number of toilets required. This may be the best ratio which it is possible to approach at the time of adoption. Within five years that standard may be so low as to prevent improvement toward a more desirable ideal which would otherwise be reasonably attainable. It is therefore particularly desirable to formulate standards for existing dwellings in such a way that they can be readily and promptly modified to make possible a maximum rate of progress.

In some communities there exist housing ordinances affecting existing structures that are effective and are enforced. They have been modified and improved from time to time, and have stood the test of courts and contain adequate regulations in specific form.

Even where good housing codes are administered by other agencies, the local health department must probably assume certain fundamental responsibilities with respect to occupied housing. Where there is no comprehensive regulation the health department has potential powers which may be called upon to meet the need. For the undertaking of such a task there is useful precedent in the historic and generally accepted rule-making powers of the health department. Local health departments in many states now have the power to formulate a sanitary code containing detailed requirements for realizing the broad general purposes of protecting the public health. Such a code of regulations has the advantage of being pre-



pared by public health experts and the even greater advantage that it can be readily and progressively amended to conform to changing needs and possibilities. It is not a question of formulating absolute standards of perfection, but of proceeding step by step from an unsatisfactory status toward an ideal as fast as expediency and public opinion may permit.

In communities where the rule-making power of the health department is broad and well established, this department, in coöperation with local building, zoning, and fire authorities as desirable, can proceed under its general powers to formulate regulations under which it may order such corrections as are essential for the protection of life and health, condemning such properties (after due notice and opportunity for public hearing) as cannot meet, or after a reasonable time have not met, the fundamental needs of health and safety.

Where such basic rule-making powers are not considered legally or psychologically adequate, a city ordinance or state law could be passed specifically authorizing the local department of health to formulate a body of regulations for preserving health and safety in all existing dwellings designed or utilized for human occupancy.

In Baltimore, for example, an ordinance of this type was added to the *City Code* in 1941.<sup>3</sup> After certain general provisions fixing the responsibility for cleanliness on the occupant and the responsibility for repair on the owner or agent it is provided that

1. "Whenever any dwelling, or any building, structure, excavation, business pursuit, matter, condition or thing in or about a dwelling on the lot on which it is situated, or the plumbing, sewerage, drainage, light or ventilation thereof is found by the Commissioner of Health to be dangerous or detrimental to life or health, the Commissioner of Health may order that the matter, condition or thing be removed, abated, suspended, altered or otherwise improved, as his order shall specify."

2. "Whenever it shall be found by the Commissioner of Health that a dwelling is unfit for human habitation, or dangerous to life or health by reason of want of repair, of defects in the drainage, plumbing, lighting, ventilation or the construction of the same, or by reason of the existence on the premises of any condition likely to cause sickness or injury among the occupants of said dwelling, or for any other causes affecting the public health, the Commissioner of Health may issue an order requiring such dwelling to be vacated."

3. "The Commissioner of Health is hereby authorized and empowered to make and adopt such rules and regulations as he may deem proper and necessary for the enforcement of this ordinance for the better protection of the health of the city."

This type of ordinance, though its efficacy has not been fully tested, seems to offer a most valuable approach. Such broad delegation of powers may of course be challenged in litigation, and it will be of interest to follow suits which may arise under this or similar ordinances. There is, however, abundant court experience in public health cases to suggest that all reasonable exercise of these powers in good faith will be upheld. Such an enabling act may be adopted on either the state level or—if authorized by grant of power by the state—the local level. If it be a state law, the power to formulate specific regulations should preferably be delegated to local health authorities. A statewide body of regulations would necessarily have to be very general and either too weak for advanced urban areas or too severe for many rural areas. Furthermore, in rural areas the machinery for enforcement is generally lacking, and it is fundamentally unsound policy to promulgate regulation which cannot be enforced.

Whether housing regulations be in the form of statutory enactment or administrative regulations, it is obvious that their provisions should be correlated with those of local zoning ordinances.

In any case, when the sum of defects present in a dwelling is such as to con-

stitute a serious menace to the health or safety of the occupants and where such condition cannot be—or after a reasonable time has not been—corrected, the health officer should have power to forbid continuance of human occupancy or to order demolition.<sup>4</sup>

#### SPECIFIC OBJECTIVES AND CONTENT OF HOUSING REGULATIONS

If we accept the general principles of approach outlined above, the questions next arise: For existing dwellings, what conditions of use, occupancy, and maintenance should be set as prerequisites to continued habitation? With respect to new housing, what factors should the regulations cover as to site requirements, construction, interior layout, and equipment? The same factors must be considered, generally speaking, whether the controls take the form of a specific state housing law or local ordinance, or that of administrative regulations under an enabling act.

*New Construction*—While the committee is not here dealing primarily with either the administration or the detailed content of building codes or other controls for new construction, it has become clear in our studies thus far that the usual building code fails to provide certain safeguards which are essential from the viewpoint of health, safety, and amenity. Proper regulation of new construction is of such importance that it cannot be passed over lightly even in a statement dealing essentially with existing structures. We therefore call attention to the scope and some of the principal weaknesses of typical building codes, in order to bring these to the attention of public health officials or others who should be concerned with long-range improvement of housing regulations.

Certain of the health and safety regulations needed for new dwellings are well handled in the usual building code, and these are clearly outlined in recent

literature on building codes, including bulletins on code arrangement by the National Bureau of Standards and the American Standards Association.<sup>5</sup> These model documents set forth factors of building construction, design, and equipment which should be controlled. The form of their recommendations approximates a statement of the fundamental objectives of regulation for each topic considered.

Building codes drawn according to these recognized models will cover such health, safety, and amenity factors in new housing as the following:

*General building restrictions:* construction safeguards within fire districts, restrictions as to building height with different types of construction, and similar factors.

*Light and ventilation:* number, area, and openability of windows; requirements for artificial lighting; and (perhaps rather obliquely under such a heading) the sizes of habitable rooms and the regulation of their occupancy.

*Means of egress:* number, types, and location of exits including fire escapes; width of stairways and exterior doors, etc.

*Construction requirements:* quality of construction and features of wall and floor design needed for structural safety.

*Fire protection:* standards for fire-resistiveness with various types of construction.

*Chimneys and heating appliances:* Standards of design and construction of heating installations are prescribed, but the proportion of rooms to be provided with heating facilities is commonly ignored, as are measures for the control of smoke.

*Electrical and plumbing requirements:* These are commonly handled by reference to separate codes. Such codes specify the quality of installation if it is made, but often do not require that basic facilities be actually provided.

It is urged that in future regulations for new housing construction these usual items of building code coverage be supplemented by regulations on at least the following subjects:

*Site requirements:* New dwelling construction should not be allowed (and building permits should not be issued) unless adequate water supply of good sanitary quality and adequate sewage disposal facilities exist, or

unless their development is shown to be feasible and is included in the construction scheme. Restrictions should be placed on the development of swampy or floodable lands, and there should be requirements for compliance with local subdivision regulations and conformity with master plan provisions for streets and roads.

*Sanitary provisions:* A new type of chapter should supplement the traditional plumbing code provisions on quality of materials and workmanship, setting definite minimum standards as to the number and types of sinks, toilets, and installed bathing facilities to be required in various types of dwellings. Running water, toilet, and bath or shower should be required in every urban dwelling unit. Cross-connections and back-siphonage should be clearly dealt with if they are not handled in a plumbing code.

*Room sizes, layout, and space requirements:* Code regulations in the future should seek to define room sizes in such a way as to permit the installation of necessary furnishings and allow for unimpeded circulation and the exercise of each room's basic functions under normal occupancy. Reasonable storage space should also be required.

*Household equipment:* In view of the "industrial hygiene" problems involved in the performance of some 60 person-hours of housework per week in the average home it would seem reasonable to set some standards of adequate facilities for cooking, laundering, and food preservation.

*Vermin and insect protection:* Appropriate provision should be made for rat-proofing, and for termite protection and mosquito-proofing in regions where these are necessary.

Other new types of chapters may be needed to deal with problems of miscellaneous mechanical equipment (installed refrigerators and such types of forced ventilation systems as may occur in multiple dwellings) and secondary buildings on the same plot with residential structures.

A most encouraging attempt to remedy some of the weaknesses of the usual building code is found in the federal Central Housing Committee's recent dwelling construction code recommended for war housing areas.<sup>6</sup> This document appears to mark a distinct step forward in dealing with some of the customary shortcomings indicated above.

Little consideration has yet been given by the Committee on the Hygiene of

Housing to the usual coverage of zoning ordinances, but it is believed that if these were more carefully drawn with respect to standards of healthfulness in housing they might be made the instrument for some of the environmental regulations clearly needed but lying beyond the scope of construction codes. They should aim to avoid overzoning for industry and business, and to prevent too easy modification.

*Existing Dwellings*—For the control of existing dwellings there is much less systematic doctrine or practical experience than that available for new construction in building and related codes. Aside from the few states having general housing laws (some of which appear to cover matters of occupancy and maintenance with considerable skill) and the rare instances in which cities have housing codes or rather complete housing sections in building codes, control of occupied housing is usually carried under the broad nuisance powers or scattered specific provisions of sanitary codes or building codes.

The committee has not yet found any set of regulations for existing dwellings which can be taken as a wholly satisfactory model. During the Connecticut study previously cited, a tentative series of topics was therefore devised, under which the essential problems of structures in use may be analyzed. It is recognized that some of these categories may need to be combined or altered in the drafting of practical regulations. However, the listing of these topics, with illustrative statements under a few of them as to the purposes which should be served by specific regulations, will indicate the range of problems involved, and will reveal significant gaps in the usual type of occupancy regulations.

*Occupancy and overcrowding:* To prescribe minimum standards of space per family or per person (probably in terms of room units or floor area rather than cubic space, the

usual criterion) and to assign responsibility for determining the capacity of dwelling units<sup>7</sup>; to specify types of rooms (such as those without windows, those of seriously deficient size, privacy in circulation, shape, lighting, heating, etc.) which shall not be used for human occupancy; to define "person" for purposes of enforcement and to specify the ages at which separate sleeping rooms should be provided for children of opposite sex; to establish occupancy norms for special types of dwellings such as lodging houses, trailers, and dormitories, and norms for non-typical spaces (basements and attics with living quarters) in common types of structures; to deal with special occupancy problems in case of disease.

*Permitted uses, use-conversions and alterations*<sup>8</sup>: To limit the types of nonresidential use which may be introduced into dwelling structures or their immediate environment; to safeguard residential uses from hazard or nuisance connected with such nonresidential uses; to provide for needed physical separation between residential and hazardous non-residential uses in mixed structures; to assure the maintenance of structural soundness and safety in relation to use-changes involving alteration; to insure that suitable occupancy controls shall routinely be invoked in relation to changes of use; to control permitted changes in type of residential use (including space and sanitation requirements for conversion to light-housekeeping units).

*Structural soundness and repair*: To require maintenance of repair of all major elements of a dwelling as necessary to provide: (a) tightness to the weather; (b) reasonable possibilities of heating; (c) control of rat harborage; and (d) reasonable freedom from danger of bodily accidents or structural collapse. To provide for substantial compliance with standards for new construction in the event of major voluntary alteration or restoration.

*Provision and maintenance of sanitary fixtures*<sup>9</sup>:

*Maintenance of utility supplies (water, electricity, gas) in safe operable condition*

*Heating, lighting and ventilation of habitable rooms*

*Lighting and cleaning of shared spaces such as public halls*

*Storage and disposal of garbage and other refuse*

*General sanitation and control of nuisances*

*Obstructions to egress; other specific fire hazards*

*Fire protection equipment*

*Control of rodents and insects*

*Safeguards for abandoned or unused dwellings or accessory structures.*

These, or items like them, are the elements out of which it would seem a framework for clear and adequate housing regulation can be developed.

## ADMINISTRATION AND ENFORCEMENT OF HOUSING REGULATIONS

Whether the fundamental housing standards are formulated in an ordinance or in a set of regulations, or in a combination of the two, they will be ineffective without an adequate force of trained inspectors and an orderly system of administrative enforcement. It is most desirable that both the inspection service and the legal procedures for abatement should be coördinated in a given area.

*Value of Coördinated and Systematic Inspection*—The examination of plans for new construction and the inspection of actual work performed on new buildings may well be carried out—as at present—by building departments and fire departments. So far as inspection of occupied dwellings is concerned, we have in many cities at least three different groups of inspectors—those of the health, fire, and building departments—operating in the field. It would seem wise to consider the feasibility of co-ordinating such field inspection services. Instead of sending an electrical inspector one week, a fireman the next week, then a plumbing inspector, and finally a sanitary inspector to the same house, it might be possible to correlate the work of these inspecting staffs so as to promote efficiency and economy. In small communities it may often be impossible to have more than one inspector reasonably qualified to deal with the various fields involved. Such an inspector might most logically be attached to the local health department, but in one city the building department makes all such inspections in residences except for fire hazards and this plan works satisfac-

torily. In cities where three groups of inspectors are working it should be feasible to provide for some coördination of effort without impairing the legal powers of any department concerned.

One of the major advantages of a combined or coördinated inspection service would be the unification of records, so that copies of all information relative to a given piece of property could be made available in one place to all groups concerned with housing (including relief and welfare agencies, whose interest in, and possible contribution to, improved housing regulation is perhaps too little recognized).

It is obviously essential that the inspection staff should be adequate in number, capacity, and experience. Elimination of overlapping inspection responsibilities should increase the effectiveness of available personnel. At least one recent study of inspection practice suggests that little or no more man power would be required for thorough and systematic inspection in problem areas than is now used for sporadic inspection in response to nuisance complaints.

The common practice of inspection only on complaint is completely ineffective. Inspection procedures should be designed not only to secure corrections in individual premises but also to give an over-all measurement of housing defects and needs throughout the problem areas of a community, as a guide to appropriate long-term programs of enforcement or reconstruction. The importance of systematic inspection in developing effective housing regulation can hardly be overstressed. Inspection of this type, together with enforcement graded according to the quality of housing areas, is the distinguishing feature of the notable recent work in housing inspection by the Memphis Health Department.<sup>10</sup> The Committee on the Hygiene of Housing has developed and tested an appraisal technic to serve the same purpose, applicable in any city

and suitable for execution by the health department or a coöperating group of city agencies.<sup>11</sup>

Systematic inspection is practised in Cincinnati under a modernized building code with comprehensive housing regulations for both new and existing dwellings. For at least ten years substantially all residential inspections, except those for fire hazards by the fire department, have been done by the building department. This department has a special force of housing inspectors which under a special supervisor inspects annually every dwelling in the major substandard housing areas, issues orders, and makes follow-up inspections to see that the orders are complied with. For several years every building in these areas has been graded each year as to condition and occupancy, as has each census tract in the area. Vacation of unfit buildings and of those containing serious violations of the law is routine, as is condemnation of unsafe structures. For a period of ten years an average of from two hundred to four hundred dwelling units in unfit buildings have been demolished annually under orders of the department.

Proposals now under consideration in the City of Hartford, Conn., suggest a possible realistic method of coördinating not only inspection methods but the underlying regulations of various departments. In 1939 an act was passed by the state legislature providing that

"... the Court of Common Council of the City of Hartford, in addition to the powers vested in it by law, shall have power . . . to make, alter and repeal ordinances for the following purpose: to establish a coördinating authority for the enforcement of police powers relative to the repair, vacation and demolition of buildings and dwellings, which coördinating authority shall include the Chief of the Fire Department, the Health Officer and the Building Supervisor."

\* The joint committee established under this act has outlined its functions as follows:

1. To assign, through proper legislation or administrative changes, definite and appropriate inspection responsibilities of each inspectional agency.
2. To formulate procedure, reporting and recording forms designed to get maximum coverage and minimum duplication in each inspectional field.
3. To establish policies and plans for systematic inspection of all substandard buildings and dwellings in the city.
4. To provide for centralized maintenance of all inspection records and reports of each building in the city.
5. To establish in the committee office a definite procedure for:
  - a. Reinspection or "follow-up" inspection by special inspectors; and
  - b. The handling of complaints in the several fields of inspection.
6. To serve as a central clearing house for information on the conditions of buildings needed by citizens, other governmental agencies and local organizations.
7. To formulate, as needed, recommendations to the Court of Common Council and the State Assembly relative to desired additions or modifications in building and dwelling maintenance standards.

Analysis of the Hartford ordinances prior to the proposed coördination showed that 19 different items of inspection were specifically recognized, 4 being assigned to the health department alone, 3 to the building department alone, 1 to the fire department alone, 5 to both the health and building departments, 2 to both the health and fire departments and 4 to both the building and fire departments! Under a new plan proposed by the joint committee, 9 of these problems would be assigned to a combined inspectorate of the building and fire departments, and 8 to the health department, leaving 2 (ventilation and heating) to be jointly handled. Both the inspection staffs would operate under the direction of a group representing all three departments.

*The Place of Joint Enforcement Procedure*—The experience of other cities seems to support the view that joint departmental action, even when informal, may be much more effective than

the customary programs of separate enforcement. The recent cases of two small Eastern cities are enlightening. In one community the health department, about two years ago, employed a sanitary engineer to initiate a systematic program of housing inspection. The department has been working closely with the local housing authority on the program of equivalent elimination embodied in the agreement between the city and the housing authority under the U. S. Housing Act. Some two hundred dwelling units were selected—as a result of the health department's inspection program—as being substandard to a degree requiring immediate action. The owners of one hundred of these properties have thus far been given orders to appear before a committee made up of representatives of the health department, the building inspector, the fire chief, and the housing authority. The owners have been given a chance to be heard after the specific requirements necessary to bring each building up to standard were outlined. They have been offered the choice between rehabilitation or demolition, and not one of these owners has legally contested the action of the committee.

The other city has a part-time health officer, a part-time sanitary inspector, and no housing authority. The sanitary inspector, along with the building and plumbing inspectors, was recently sent out to cover a group of dwellings which had been the subject of frequent complaints. The owners were summoned before a committee consisting of the health officer and the three inspectors concerned, and were given notice as to the varying periods of time in which specific gross violations must be corrected. Here too compliance has generally been obtained to the extent that the current shortage of building materials would permit.

It seems clear that much can be accomplished without waiting for the de-

velopment of fully coördinated legal instruments, by the simple expedient of pooling the technical knowledge and prestige of health, building, and fire departments<sup>12</sup> for enforcement purposes in the worst slum areas. The alert chief executive can bring about such joint effort by administrative action wholly within his present powers.

In all such programs, the authorities concerned must have the backing of informed and sympathetic public opinion, if substantial results are to be attained. Such support depends on organized campaigns of education and a basis of public confidence in the officials concerned. The support of the press is vital, and concerted action on the part of organized labor, citizens' housing councils, and other nonofficial bodies is of the greatest value.<sup>13</sup>

#### TOWARD A SYNTHESIS OF REGULATORY AND CONSTRUCTIVE PROGRAMS

Thus far we have been concerned only with the adequacy of regulations for their specific task of controlling the physical conditions of housing. But it should be recognized also that police power regulation can be made a powerful instrument in shaping long-range housing policy, and particularly in aiding the creative work of housing authorities and planning bodies. Here the task is obviously not that of the enforcement agencies alone, but of the entire municipal administration.

A general limitation of our present housing regulations is their usual failure to provide for enforcement other than by mandatory abatement, demolition, closure, or token fines. Housing consciousness, on the part of both the general public and the courts, has reached a new high level and it is reasonable to suppose that considerable support would be given to measures calling for a policy of economic discrimination against unfit dwellings; stipulating, for example, that

in premises where substandardness is established by objective appraisal, rents may not be increased<sup>14</sup> or possibly even that they may not be maintained above a level set to penalize substandardness.

A second and even more striking weakness of restrictive housing laws is their general lack of any intent to employ the sanctions of police power in support of creative programs such as those of municipal housing authorities and planning commissions. Our pattern of housing regulation has been largely handed down from a time when there was no background of positive public policy for housing and city planning. Increased governmental aid on the constructive side, represented in the past few years by the public housing program and by federal aid to planning bodies, has brought strong potential forces into play for community rebuilding and for the strengthening of police power controls. If fully recognized and exploited, these forces may revolutionize our attitude toward law enforcement and the instruments under which it is carried out.

The development of official local housing standards coupled with sound inspection and appraisal technics should warrant the drafting and testing in court of more effective regulations to deal with buildings and areas below a certain standard. For example, the courts might now sustain a law which would provide that seriously substandard dwellings shall be taken out of use after a limited period allowed for amortization of any remaining economic value of the structures. Local authorities might be authorized within certain limits to forbid rent collection after an appropriate deadline.<sup>15</sup>

Not only should such laws, if sustained, help in deflating speculative property values which have blocked the replanning of slum areas, but they would serve notice on communities as to the number of dwellings to be replaced

by a given date. Local housing and planning bodies would thus be stimulated to more vigorous programming and search for funds. Furthermore, since the economic value of the worst houses would presumably have been liquidated during the period of grace, it should be possible within a reasonable time to clear slums without payment for such buildings. This is accepted practice in British slum clearance, and the lack of similar powers in America is estimated to have cost our public housing program, in a typical year, nearly \$500 per new dwelling unit built.<sup>16</sup>

We must begin to think of comprehensive housing programs in which systematic inspection and official designation of substandardness by areas will serve as beacons to guide the agencies of reconstruction into slum areas where improvement under the police power is hopeless, but which may offer prime opportunity for governmental or private rehousing or other rehabilitation projects. In other words, the vigorous and imaginative exercise of regulative powers may supply for the first time a method of earmarking whole districts, helping to indicate both the relative urgency and the types of constructive programs needed for improvement or rebuilding.

Several types of post-war reconstruction schemes now being officially considered are chiefly based on large-scale slum clearance and housing construction, both as a primary aim of a democratic peace and as a basic type of public works to cushion the post-war economic readjustment. Such programs may be expected to put a premium on effective housing regulation under the police power. Large-scale reconstruction will require closer definition and measurement of substandard housing areas than we now possess, both to delimit sharply the areas needing rehabilitation and to indicate the nature of the remedies required. In the interest of sound public

policy, such reconstruction programs should be able to operate with reference to legal standards which carry effective economic sanctions, so as to obviate the payment of public works funds for the purchase of dwellings maintained in gross violation of the law.

The prospect of these post-war programs should be used as leverage to bring about a strengthening of housing regulation hitherto impossible. In recent years over thirty states have passed a progressive and wholly new type of local housing authority legislation, in direct response to the benefits offered by the public housing program. Similar results should be made to grow out of the post-war redevelopment schemes, by making participation in their benefits conditional upon the development of adequate local housing standards, systematic appraisal and enforcement in substandard areas, and effective means for bringing down the purchase price of substandard houses in clearance areas.

#### NOTES

1. These contacts were made by the former Subcommittee on Housing Codes, under the chairmanship of the late Morton G. Lloyd of the National Bureau of Standards.

2. The exact form of the requirements must of course vary with height of buildings, class of construction, and type of use, but the degree of protection secured should be essentially the same.

3. *Ordinance No. 384*, approved March 6, 1941. A similar ordinance with respect to rooming houses (No. 507) was approved June 28, 1941.

4. It has not been possible here to deal with certain questions which in effect relate to the legal bases of housing regulation—such as the limits within which the courts will support retroactive standards for the improvement of existing buildings, and the theoretical and practical differences between enforcement at the level of mandatory repair or closure on the one hand, and demolition of substandard structures on the other. These questions and their meaning for the drafting and enforcement of housing regulations will be explored in future studies of the committee.

5. See *Preparation and Revision of Building Codes*, National Bureau of Standards, *Report BMS 19* (May, 1939); and *Building Code Arrangement*, Building Code Correlating Committee of the American Standards Association (Mar. 5, 1937).

6. *Recommended Building Code Requirements for New Dwelling Construction; with Special Reference to War Housing*, prepared by Subcommittee on Building Codes, Central Housing Committee on Research, Design, and Construction (April, 1942, preliminary issue; printed edition to be published by National Bureau of Standards).

7. Important administrative questions arise in this connection. The usual type of occupancy regulation



in terms of cubic feet per person tends to be meaningless except for enforcement in extreme cases, since usually no agency is made responsible for designating the legal capacities of dwelling units and for checking the observance of these capacities. Occupancy licenses would make it possible to designate and post the maximum number of persons permitted to occupy each dwelling in a licensed tenement or other structure, and should help materially in establishing legal responsibility for willful violation by either tenant or landlord.

8. Provisions under this heading will tend to overlap with zoning regulations, against which they should be checked in any particular locality.

9. Similar statements of purpose apply, of course, to the remainder of these topics.

10. See Enforcement and Subsidy in the Control of Slums, L. M. Graves and Alfred H. Fletcher, in *Housing for Health*, Committee on the Hygiene of Housing (1941), pp. 18-36.

11. This technic and its application to local housing policy are described in the recent report of the Subcommittee on Appraisal of Residential Areas, An Appraisal Technique for Urban Problem Areas as a Basis for Housing Policy of Local Governments, *Pub. Health Rep.*, 57, 9 and 14 (Feb. 27 and Apr. 3, 1942); available as *Pub. Health Rep. Reprint No. 2359*, free from the Committee on the Hygiene of Housing, 310 Cedar Street, New Haven, Conn., or at 10 cents per copy from the Superintendent of Documents, Washington, D. C.

12. While these three are usually the agencies most directly concerned with housing enforcement, it should not be forgotten that numerous other official and unofficial groups are concerned with the effectiveness of housing regulation and may be in a position to give such regulation effective support. For example, in one city studied by the committee the health department reports that it coordinates its housing inspection with the work of—or makes known its findings to—the following agencies: Official—Building Department, Fire Department, Police Department, Welfare Department, City Plan Commission, City Comptroller, Zoning Board, Police Magistrates, City Housing Authority, City Law Department, Federal Rent Administrator; Non-official—Press, Housing Council, Real Estate Board, Women's Civic League.

13. For an example of the rôle which can be played by a favorable press, see Housing as a Health Officer's Opportunity, *A.J.P.H.*, 32, 9:1001-1004 (Sept.), 1942.

In Cincinnati the Better Housing League, a citizens' housing agency, cooperates closely with the housing bureau of the building department. As buildings are ordered vacated or condemned, the bureau routinely notifies the League, whose visiting housekeepers then set about to find homes for the tenants so that delay in following through on vacation procedures is avoided and the bureau chief freed from the handicap of concern about getting tenants out.

14. An act embodying substantially this principle, the so-called Minkoff Law, is in force in New York State: Laws of New York, 1938, ch. 675.

15. There is an interesting ancient precedent for this particular type of action. In the reign of Queen Elizabeth two landlords who had bought and subdivided a tenement in Hog Lane were fined and committed to the Fleet Prison; and it was specifically provided that the indigent tenants should remain in their quarters without payment of rent—the buildings to be torn down on their departure.

16. "Because of the failure of municipalities to exercise the power of clearing slums during the last one hundred years they are now paying dearly to purchase them. The present United States Housing program proceeds on the announced theory that slums will be removed by contracting with the cities to exercise their police power. Realistically, however, it seems that the greater portion of the immediate slum demolition is going to be incident to the purchase of land sites in slum districts. This will be counted as 'equivalent elimination' under the Housing Act, but it is not accomplished through use of the police power but rather by compensation being paid. The cost of acquiring slum buildings—not land—under the contracts for 1939 was placed at \$23,871,431. At the same time some 49,449 dwellings were to be erected on slum or partial slum sites where these buildings were purchased. This means that for every new dwelling unit erected in a slum or blighted area approximately \$480 is to be paid for slum improvements standing upon the property.

"In some cities this cost of demolition runs to sizable figures: in New York and Boston the total exceeds two and a half million dollars; in New Orleans, Baltimore and Pittsburgh it approximates one and a half million dollars, and there are a number of other cities where it approaches that figure. Thus for every new dwelling unit built in a slum area in which it has been necessary to buy substandard improvements, the community is charged nearly \$500."—William J. Barron, *Low Cost Housing and Slum Clearance*, unpublished doctoral dissertation, Yale School of Law (1941).

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## FUEL RATIONING

DURING the first chilly fall days there was released by the Fuel Rationing Division, OPA, a report bearing upon the Medical and Public Health Aspects of Heating Oil Rationing. This is a valuable document and, to say the least, is seasonal. It very sensibly reviews, in so far as scientific knowledge permits, the relationship between heating, ventilation, comfort and health; and one senses an intimation that, while heretofore our tendency has been to explore just how comfortably warm one might be without injury to health and efficiency, the present situation demands that we learn now just how uncomfortably cool one might be and still remain alert, precise, and well.

A temperature of sixty-five degrees Fahrenheit is to be provided for oil-heated dwellings and apartment houses, with higher ranges in special circumstances: where there are young children, the aged, the sick. Advice is given as to the desirability of wearing more clothes, and there is a delicate and restrained reference to "an extra undergarment." Adjustment to these somewhat chilly living and working conditions is going to be difficult for the citizenry of the United States. Doubtless there will be many landlords who will, in the name of patriotism, hew to the freezing line; and many tenants will attempt to settle old scores by reporting guilty and unguilty owners alike. Possibly, where sanitary or other codes require a certain heat performance on the part of building operators, the local health departments concerned may receive so many complaints they will wish that the subject of heat rationing had never been mentioned.

Unfortunately there is a paucity of scientific knowledge as to the best optimum indoor heat for homes and working places during winter, and, strictly speaking, there is no such thing as an optimum temperature, applicable in all circumstances, as humidity, air movement, activity of those exposed, and how warmly they are garbed, enter definitely into the situation. Our previous standards, therefore, have rested upon assumption rather than upon accurate information, and fuel oil rationing on a national scale may permit the accumulation of worth while data on this important subject. But even in the absence of such information, it seems likely that fuel rationing and its consequent lowered indoor temperatures will do

good rather than harm. The temperature at which offices and living rooms have been kept since the general adoption of central heating has been a part of soft living, perhaps an index of a national softening. No other nation in the world has so pampered itself in this direction as has the United States of America; and visitors from other countries, inured to inside temperatures from sixty to sixty-five degrees Fahrenheit, find it hard to tolerate the headiness produced by the hot, dry, stagnant air in our homes and public buildings.

Be all this as it may, those responsible for the public health would do well to inform themselves thoroughly as to conditions required or permitted under the fuel rationing rules. Further, it would seem wise for them to explore and study local problems and potential problems so that, in so far as is practicable, they may be in position to prevent hardships, critical situations, and violations. However, in spite of such foresight, complaints will inevitably arise and many local health officers will be called upon to investigate and to serve somewhat as arbiters. In the circumstances, it might be well for health departments to institute a simple procedure for handling such complaints as expeditiously and as unharassedly as possible.

Sixty-five degrees Fahrenheit would be as a roaring furnace compared to what the troops undergo in Alaska and Iceland.

## WHAT AND WHO IS AN EPIDEMIOLOGIST: CURTAIN

AS forecast in the editorial section of the September *Journal*, with this issue the discussion *What and Who Is an Epidemiologist?* is brought to a close. The discussion has been interesting and to some extent productive, though we are inclined to doubt that it has changed many opinions. Some will continue to insist that an epidemiologist is never to be found indoors but only in the byways and hedges, tramping around on the uppers of his shoes, having worn away the soles in a detective-like search for the common source of a local outbreak. Others, who have thought of the epidemiologist as being primarily concerned with the laboratory life of causative organisms, will persist in garbing him in a white coat; and many will remain steadfast in refusing to believe that an epidemiologist is nearby unless they hear, and hear distinctly, the click and hum of his calculating machine.

We are not sufficiently omniscient to settle the matter, and like Frank Stockton, with *The Lady or the Tiger*, must leave *Journal* readers to their own solution of the mystery *What and Who Is an Epidemiologist*.

The two last received letters on the subject are presented below:

Harold F. Gray, Sanitary Engineer, of Berkeley, Calif., writes as follows:

After having spent thirty-five years in, and around the fringes of, public health work, some of the replies to your editorial on "What and Who Is an Epidemiologist?" (*A.J.P.H.*, 32:414 (Apr.), 1942) are either amusing or distressing.

Offhand, and without thinking, I can

answer the question promptly by giving the names of a few men: L. L. Lumsden, W. T. Sedgwick, W. A. Sawyer, H. R. Carter, K. F. Meyer, W. H. Frost, A. W. Freeman, L. W. Hackett, William Budd, John Snow, and P. L. Panum; and there are many others.

There can be several kinds of epi-

demiologists, of which the best and most useful is the "shoe leather" man, who works all day and part of the night getting the facts down on cards, and spends the rest of the night down on his knees on the floor of his hotel room, endlessly shuffling these cards into piles until, he hopes, a significant grouping turns up.

How does one get to be an epidemiologist? No one can tell in advance. A well rounded public health training helps, but our greatest epidemiologists had merely the usual medical training of their time. Chance, the direct contact with epidemics, gives the man who is intrinsically an epidemiologist the opportunity to show forth his talents. But the inquiring mind, the desperate necessity of arriving at the truth without blinking at inconvenient facts, the determination to get all the facts, plus a certain facility (perhaps inspiration) in asking the significant questions, must be born into

a man, if he is to be an epidemiologist.

Of the answers so far published, those of Allan W. Freeman and C.-E. A. Winslow are the best, probably because they have been matured out of rather long experience, but J. E. Perkins's letter has its points, and shows that he has worn out his share of shoe leather. But I cannot agree with Dr. Perkins that epidemiology is a science. It is an art, employing skillfully many sciences in its practice.

The definition given by Dr. Adams, limiting the epidemiologist to "a physician (M.D.) who investigates," or "a medical inspector," is far too narrow. Louis Pasteur was not a physician, but he was an epidemiologist at heart. Nurses, bacteriologists, veterinarians, engineers, entomologists have upon occasion and opportunity done excellent epidemiological work.

The practical definition of an epidemiologist is Biblical (Matthew, 7, 16) "By their fruits ye shall know them."

Charles F. Bolduan, M.D., Director of the Bureau of Health Education, New York, N. Y., as a comment on the subject under discussion, quotes this from the third edition of his book, *Public Health and Hygiene*:

The epidemiologist should, of course, by a physician and have had training in laboratory work and in statistical methods. It is highly desirable that he maintain a hospital connection in order to keep himself constantly abreast of clinical medicine. Knowledge of a foreign language is an asset. To be successful the epidemiologist must have imagination and a strong leaning to curiosity. He will constantly be asking himself, Why? Why do epidemics of poliomyelitis come in summer? Why has scarlet fever mortality declined so markedly? Why does leprosy spread in certain parts of the world and not in others? Why is diabetes so much more prevalent among Jews? Why is diabetes mortality among married and

widowed women over forty-five years nearly three times higher than it is among unmarried women of the same age? Why the higher incidence of peptic ulcer among males? The greater prevalence of gall-bladder disease among females? The cyclic recurrence of measles, meningococcus meningitis and some other infectious diseases?

It is the constant search for answers to such questions that results in medical progress and in the more effective control of disease.

At the present time epidemiologists having all the qualifications described above are not numerous. In most health departments the epidemiologist confines his attention to the communicable diseases.

## LETTER TO THE EDITOR

TO THE EDITOR:

Enemy action and the greatly increased burden of the war effort have so seriously curtailed the transportation of petroleum products that households this winter can be heated only by limited supplies of fuel oil; consequently, the problem of maintaining health in temperatures lower than usual is not only difficult, but *must* be solved to prevent illness. Before the war, the East Coast received about 95 per cent of its oil by means of tankers. So many of these tankers have gone down that an extremely serious dislocation in our petroleum distribution system has come about. In view of the resultant urgent necessity to share limited supplies fairly, the Fuel Rationing Division of the Office of Price Administration has drawn up a plan for the rationing of fuel oil in thirty states designated by the War Production Board. The fullest patriotic coöperation of your profession will be necessary, and without doubt will be given.

Basic rations for fuel oil will be allotted householders by the Office of Price Administration through its rationing boards. This ration will be based upon past consumption (adjusted for normal weather) and upon the thermal efficiency of the house as indicated by a heat loss floor area formula developed and tested by top flight heating engineers. Provision will also be made for auxiliary rations to households in which illness or the infirmities of old age make necessary temperatures higher than that afforded by the basic ration.

Application for such auxiliary ration will be made to the local rationing board by the consumer. His application will

have to be supported by certification by a licensed physician. In certifying, the physician should give the date, the name and address of the householder, and should certify to the Office of Price Administration: (1) whether the illness is of an acute or chronic nature; (2) whether it is the kind which requires higher indoor temperatures, (3) the approximate temperatures required, (4) the approximate period for which this supplemental base heat is needed. The physician may at his discretion state the nature of the illness and give any additional information which will guide the board. This certificate should be given to the applicant, who will file it with the local rationing board.

The success of the rationing plan in meeting the fuel oil emergency equitably and effectively will depend in large part upon the kind of patriotism and conscientious coöperation that the medical profession has always given in times of emergency.

It is planned that Advisory Committees of three members, comprised of two licensed physicians and the County or Local Health Officer will be set up by the County or Local Medical Association upon request of the local rationing board. These Advisory Committees will function by reviewing the cases of the certificates questioned by the local rationing board when the board wishes more detailed information and professional opinion. I am sure that the medical and public health professions will coöperate actively in setting up and operating this important auxiliary advisory body.

JOEL DEAN

*Director, Fuel Rationing Division*

# Credit Lines

A Selective Digest of Diversified Health Interests

D. B. ARMSTRONG, M.D., AND JOHN LENTZ, M.S.

## FILM NOTES

The ogre of budgetary limitations always rears its ugly head when health educators lay their plans for motion pictures. Films are expensive to produce and yet health agencies have succeeded in making commendable pictures on budgets that would look like small change to the professional Hollywood producer. Non-commercial health films, of course, are not expected to be the equal in certain respects of pictures made for theatrical use. Still the ambitious health educator has long cast an envious eye toward Hollywood—wishing that he might duplicate to some extent at least the film capital's excellent settings, photography, casting, and other facilities necessary to the production of an expertly finished picture. The health educator is realistic enough to know that such resources are not apt to be within his reach. But the hope has persisted that perhaps the professional producers themselves would take specific cognizance of health as a film subject. At last, as a war activity, this has happened—the lead having been taken by such well known companies as Universal Pictures, Walt Disney Productions, and Metro-Goldwyn-Mayer.

"Keeping Fit" is the title of Universal's contribution to health education. This film is one reel in length and is scheduled for release the latter part of October. Preview audiences have re-

ceived this picture enthusiastically. It is produced with the usual Hollywood finesse, with the advice and coöperation, we understand, of official federal agencies, and succeeds in blending entertainment and health instruction in a skillful manner. The importance of personal hygiene in relation to national strength is convincingly demonstrated in this picture, due emphasis being given to nutrition, sleep, relaxation, exercise, and proper medical care. These elements have been woven into a story that moves at a brisk tempo, thanks to a well written scenario and a cast of capable actors, including some of Hollywood's stellar performers. Watch for this picture at your local theater and exploit it in health department publicity releases. It is an effort that deserves the support of all health agencies.

Walt Disney Productions will offer two subjects of public health import. One is entitled "Defense Against Invasion," which is designed "to spread the gospel of immunization among Americans." Disney, with his usual flair for simplifying technical subject matter, depicts the battle that takes place in the body between invading organisms and the "corpuscle soldiers." The physiological reactions involved in the process of immunization are illustrated so clearly that this film has been hailed as "an ideal teaching medium for young children." The second Disney production is called "Food Will Win the War." Through pictorial statistics, America's tremendous food resources are shown, and the importance

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of food to a world at war and in the reconstructed world to come is convincingly set forth.

Another addition to the series of health films will come from Metro-Goldwyn-Mayer which will issue a picture entitled "The Magic Alphabet." This will tell the story of the vitamins.

Along with these professionally made productions, it is a pleasure to include a reference to a film made by the National Tuberculosis Association. "Middletown Goes to War" is its title, and we doubt that Hollywood could have done a better job if forced to produce this film within the limitations of the N.T.A.'s resources. The picture deals with a timely theme—the awakening of a community to the urgent health problems created by an influx of defense workers. The situations pictured are typical of those that communities throughout the land have faced since American industry geared itself to war production. As the story unfolds, one witnesses a clear-cut demonstration of the democratic way of life and this aspect of the film impresses the onlooker as much as does the picture's central theme—health protection for all. Knowingly or unknowingly, the producers have turned out a film that is a good implement of health education and at the same time a morale-builder in that it pictures the kind of community life, the kind of people, the kind of institutions, and the kind of principles that we are fighting to preserve. A competent cast—which, incidentally, reveals Dr. H. E. Kleinschmidt as an actor of no mean ability—enhances the film's general excellence.

To obtain "Middletown Goes To War," consult your state or local tuberculosis association or write to the National Tuberculosis Association, 1790 Broadway, New York, N. Y. The film is suitable for showing to many groups including health councils, industrial groups, schools, and theater audiences.

#### NOTES ON HEALTH PUBLICATIONS

Our bulging file of annual reports for the year 1941 continues to be swelled by additions, even at this late date. Among the late arrivals, two noteworthy reports deserve mention here.

From the Davidson County Department of Health, Nashville, Tenn., comes a fact-filled and nicely written summary of that agency's activities during 1941. This annual statement is considerably condensed in comparison with the department's previous reports. Yet it gives the reader a good all-round account of the work, policies, and organization of this resourceful health unit. Illustrations depicting certain phases of the department's clinical and field work are liberally sprinkled throughout the text and enhance the report's general effectiveness. Through the years steady gains in health conservation have been achieved by this department, but only a modest reference is made in the foreword of the report to the Health Conservation Contest awards which the department has received consistently since 1935. We congratulate Dr. John J. Lentz, the department's director, and his staff upon a record that many health agencies might well envy.

The 1940-1941 annual report of the Department of Health of Peoria, Ill., is a well balanced statement of 50-odd pages of compact information presented in a thoughtful and orderly fashion. It should give the people of Peoria an opportunity to ascertain in a clear-cut way just what their health department is doing. A notable record of health advances is reported in this summary. For instance, there were no deaths from diphtheria during the 2 year period covered by the report. As to cases of this disease, there were none in 1940 and only 2 in 1941. Dr. Sumner M. Miller, the Commissioner of Health, and his coworkers have every reason to feel proud of the report and the progress

reflected therein. As to make-up, the report is attractively printed and illustrated. The title is also good—"The Health of One Hundred Thousand People." (Incidentally, why can't all annual reports be given titles? An arresting title will entice many readers who would not be attracted by a document merely labeled—Annual Report.)

The 1942 edition of *Accident Facts*, published by the National Safety Council, 20 North Wacker Drive, Chicago, Ill., is a unique compendium of information for all who are interested in any phase of the accident prevention program, either from an administrative or educational angle. The data in the current edition with reference to occupational accidents and hazards will be of great value to an increasing number of state health departments as their work in the field of industrial health, in coöperation with the U. S. Public Health Service, is expanded. Furthermore, at least a few state and local health departments have recently shown a marked increase in interest in home, school, and farm safety. In this connection it should be stated that from the educational angle, the health department has experience and technics that should prove of outstanding value in controlling home accidents. The booklet of course contains a wealth of information regarding traffic accidents and other phases of the accident problem. A helpful index, pictorial charts, and a mine of statistical information make this a publication well worth the cost—20 cents to 50 cents per copy, depending upon the quantity ordered.

"Facts That Tuberculosis Patients Should Know" is the title of an excellent guide prepared and distributed by the Bronx Tuberculosis and Health Committee, 226 East Fordham Road, Bronx, N. Y. The text of the publication is presented in question-and-answer

style. The questions were selected from inquiries actually made by patients and the range of the queries covers the whole field of tuberculosis. The authors have been particularly successful in supplying clear, sound, and informative answers. This is an exceedingly practical publication, easily read, and so organized that the reader can readily turn to the questions in which he is interested. The committee responsible for this publication has made a valuable contribution to popular literature on tuberculosis.

A timely addition to the series of booklets issued by the Life Conservation Service of the John Hancock Mutual Life Insurance Company is entitled "Headache—A Signal." The text was written by Dr. W. W. Bauer whose health essays are noted for their naturalness of expression. This author has a knack for clothing his thoughts in good, everyday folk words—the words that people use when they get together to "talk things over." He has used this style to good advantage in the John Hancock booklet which gives all the facts about "what makes the head ache." The cover, illustrations, and typography of this booklet are likewise noteworthy and in keeping with the John Hancock standard. Copies of "Headache—A Signal" are available without cost from the company's offices in Boston, Mass.

A report of the New York State Trichinosis Commission has been published under the title "The Meat You Eat." This is a thoroughgoing analysis of the trichinosis problem and would serve as a valuable reference source for workers interested in this health hazard. Unlike the usual dry legislative document, this report is interestingly written and illustrated with splendid photographs, several charts, and a cartoon of "the little pig that went to market so that people could go to the hospital with



trichinosis." An appendix to the volume includes copies of various legislative acts and regulations imposed in New York for the control of "tricky trichinosis." Information concerning this report may be had by addressing the New York State Trichinosis Commission, 94 Broadway, Newburgh, N. Y.

A new monthly publication has been launched by the Department of Public Health of Flint, Mich. Its title is "Information Pleases"—a title, by the way, that is intriguing and that has a certain quality which the advertising gentry call "pull." The circulation of this publication will be limited to a selective list of one thousand, including doctors, dentists, school officials, social agencies, libraries, and parent-teacher associations. The editorial policy of the publication will be that of interpreting the health department's program rather than reporting news items. The first issue devotes its space to brief summaries of the work of certain divisions of the department and carries a "feature article" on the training and examination of food handlers. We like "Information Pleases" and believe that its monthly appearance will be welcomed by those fortunate enough to receive it.

#### STILL MORE ABOUT POSTERS

Perhaps readers of this section feel that we have "harped" on the subject of posters almost too much. We beg your indulgence, then, as we turn once more to this topic. Since posters are playing such a vast part in the current propaganda campaign of this and other nations, it is perhaps worth while, even at the risk of becoming repetitious, to keep health educators informed of the latest trends regarding this medium which Dr. George Gallup, head of the American Institute of Public Opinion, has recently called "the most effective and dependable means for

communicating with the masses of the population."

Two important concepts concerning the use of posters were set forth a short time ago by the Graphics Division of the Office of War Information. The director of that agency maintains that posters achieve maximum usefulness when used as a *part* of a campaign in which radio, public speeches, publications, and the like are also brought into play. In other words, posters *alone* should not be depended upon to "put over" an idea. Unless integrated with other media for reaching the public, posters are apt to fail to fulfil their mission. Moreover, posters should be keyed only to urgent, pressing needs of the moment. If a dozen different posters are issued on a dozen different subjects and all of them displayed simultaneously, the public becomes over-dosed and punch-drunk because all the admonitions and instructions cannot possibly be followed. Consequently, under such conditions, posters work at cross purposes and the public does not take them seriously.

Regarding the actual work of preparing a poster, here are a few suggestions which come from *Art News*, an authoritative publication on all types of illustrative material:

First, determine in a general way the type of design and lettering. Certain ideas can best be presented by pictorial illustrations, while others need a powerful word message. In no design can these two elements be given equal importance and be seen to advantage. Decide which type is the one for your purpose. Then subordinate one of the elements, else a continuous battle will take place for attention. Usually it is better to subordinate the word message, although some lettering is used in practically all posters. Feature only *one* big message—more than that divides attention.

Unification in poster design may also

be achieved through the color scheme. A great number of colors may give a poster brilliancy and life, but when the design is displayed in company with others, it will blend into the general effect and its value will be lost in the shuffle. If the design is to stand out, it must be dominantly of one color.

Repetition of a thought, a phrase, a slogan, an appeal in posters is desirable. Repetition in the case of posters may be likened to seeing people . . . the more often we see them the better we know them.

All posters should be planned for mass appeal without distinction as to class, income group, occupation, political party, or other grouping. Posters reach all the people in exactly the same way in cities and towns throughout the nation—people see posters in passing. They therefore require a maximum of simplicity in design so that the message to be conveyed registers quickly and in such a way that it becomes firmly fixed in people's minds.

All these suggestions are pertinent to the health poster and to a certain extent a series of nine industrial health posters recently issued by the U. S. Public Health Service fulfil these desirable specifications. This set of posters features everyday precautions that keep workers "on the job"—good food, exercise, cleanliness, rest, medical and dental care. While they are distinguished by colorful design and by commendably terse health messages, one cannot help but entertain some reservations as to the artist's conception of the worker. It strikes us that there is perhaps too much unpleasant exaggeration in the artist's interpretation. Unable to decide whether or not these posters would have general appeal, comments were solicited from several sources. Here are the criticisms received:

"These posters have their virtues as well as certain glaring faults. They do catch the

eye—but I see them as funny pictures. The health messages would have escaped me entirely had I not studied each poster."

"These posters are certainly a marked and revolutionary departure from the usual type of poster issued by government agencies. At first glance, I liked them. On closer examination, I seriously questioned their value as a medium for health instruction."

"They are amusing—but will the worker get the proper inspiration from them?"

"I like the technic and the bright colors. I think, however, that the conception of the worker is unflattering."

"These posters are corking—they are unusual and will appeal to the men behind the machines."

Incidentally, one poster in this series has been widely publicized in the press. Perhaps you have seen a copy of it in newspapers. It shows a dentist whose left hand bears six fingers. Whether or not this extra digit was included intentionally, we do not know. But at least this additional finger has served the purpose of garnering publicity.

If interested in securing these posters on industrial hygiene, write to the Superintendent of Documents, Washington, D. C. They are priced at 30 cents per set, with a 25 per cent discount on orders of 100 or more sets.

#### EDUCATING HEALTH EDUCATORS

An innovation in practical training for health educators is announced by the Bureau of Health Education of the American Medical Association. Upon authorization of the association's Board of Trustees, the bureau and related departments will accept from time to time two graduate students, or two undergraduate students recommended from established educational institutions, for the purpose of observing the methods and technics employed in the association's extensive health program. No tuition fees will be charged, although accepted students will be expected to defray their own expenses, including transportation for short field trips in the Chicago area. It is recommended that students can spend their time to

best advantage if attendance is planned between December 1 and May 1, when the association's activities are in full swing.

The program will afford students the opportunity of observing actual work performed by the principal departments of the American Medical Association engaged in health education. Following an orientation course surveying the entire organization of the association, intensive work will be undertaken in the following bureaus:

1. The Bureau of Health Education—Students will be given instruction in office organization, the development of source and information files, the compilation of bibliographies, the formation of plans for coöperating with medical societies, methods of handling correspondence with special reference to letters from lay inquirers seeking health information, and the preparation of pamphlets including problems of lay-out, illustrating, and printing. In this bureau, students will also have an opportunity to participate in the development of radio dramatizations and the preparation of talks and speeches for lay groups.

2. The Bureau of Exhibit—This bureau will demonstrate various types of exhibits and students will be asked to outline steps in the development of a suitable exhibit for a specified type of audience. The motion picture and the slide will also be considered.

3. The Bureau of Press Relations—In this bureau, students will observe how technical papers are translated into terms understandable to newspaper readers and how distribution is effected through newspaper press associations, the radio, and other media of public information.

4. The Bureau of Investigation—This bureau will offer students an opportunity to observe how nostrums, quackery, and pseudo medicine are combated in coöperation with federal agencies, better business bureaus, and other groups. The effects of new federal legislation on foods, drugs, appliances, and advertising will be studied.

The Editorial Department of *Hygia* will demonstrate the selection and preparation of manuscripts and related problems.

This comprehensive program will afford excellent opportunities for students

to gain first-hand information on practically every subject related to health education. Inquiries concerning the program should be addressed to Dr. W. W. Bauer, Director, Bureau of Health Education, American Medical Association, 535 North Dearborn Street, Chicago, Ill.

#### AN EDITORIALETTE:

##### "CONCERNING ACCELERATED PROGRAMS"

Another contribution to the series of editorialettes, submitted in response to invitations extended in these columns, comes from Pauline Brooks Williamson, Chief of the School Health Bureau, Welfare Division, Metropolitan Life Insurance Company. Miss Williamson writes as follows:

Schools and colleges are being rapidly mobilized in the all out war effort. Since time is an important factor, accelerated programs are being organized to speed up education.

Accelerated classes are not for young children at any time. The rate of child growth cannot be forced without distorting lives.

Accelerated classes for students in high schools, colleges, and universities, when first introduced, were watched with concern by educators. They feared that these classes might mean superficial work on the same old formal courses planned for a past era, demanding longer hours and more strain at the expense of the students' recreation and application of other laws of health. This would have been a waste of irreplaceable man power and a distinct advantage to the enemy.

Fortunately, our best colleges and universities report a different experience. In these accelerated classes more attention is being paid to worth while activities, and improved methods of attaining immediate goals for the war effort are being used. Such courses are a boon to the students and faculty because they bring more zest to the work, and

individual and social satisfaction in contributing necessary service to the world conflict. Scientific approaches to vital problems, and efficient methods of learning are being applied to specific purposes and to more efficient and speedy development of skills needed in industry and in the armed forces. University presidents and students report that the tempo of the accelerated classes, affording opportunity for the students to work to the utmost of their capacity, when accompanied by more vigilance in following generally accepted health practices, results in improved mental, emotional, and social health and in distinct advances in education. Real joy in a worth while job well done is part of our American tradition, and along with accelerated programs our cultural heritage is being preserved. To quote Dr. Charles Seymour, President of Yale University:

"It should be noted that the Army and Navy plans provide ample opportunity for the student to acquire the fundamentals of what are called the liberal arts. If a student's interests and aptitudes lie on the academic rather than the scientific side, he is urged to pursue them in his major course. This is wise educational policy in the matter of training men how to use their minds, and it will certainly serve the essential purpose of the Army and Navy. It is equally wise educational policy for the post-war future of our nation. The things for which we fight would lose most of their value if the classical heritage of our past were lost, and if the American people were no longer trained to appreciate the beauties of art and music and the grandeur of the world's best literature. We are fighting, not merely to survive as a free, but also as a civilized people."

Health officers can throw their powerful influence toward intelligent and patriotic acceleration in medical colleges, schools of public health, as well as in teachers colleges.

(EDITORIAL NOTE: Editorialesques from other contributors will be welcomed. Choose your own subject—preferably one related to health education. Publication of submitted material is not guaranteed, though serious consideration will be given to all contributions.)

#### CONCERNING LETTERHEADS

As Bauer and Hull point out in the latest edition of their text book *Health Education of the Public*, many health agencies, and especially voluntary societies, have a great tendency to cover their letterheads with lists of names, committee memberships, and the like. Some letterheads carry so much data of this sort that very little space is left for correspondence. It strikes us that this is a form of "window dressing" that could very well be deleted, with the space being given to more pertinent information.

The letterhead used by *Hygeia* is a good example of how marginal space can be utilized to convey an interesting and significant message. The left-hand border of this letterhead bears the following statement:

#### PEOPLE DIFFER—

No two living things are alike. Physicians do not treat symptoms or diseases. They treat patients. A list of symptoms or a long case history in a letter is no basis for a positive conclusion as to what is wrong with the patient and what he ought to do about it. There is no standard dosage for drugs applicable to all patients under all circumstances. There is no standardized diet useful to all patients suffering from the same disease.

We are glad to give all the health information we possibly can, but we must decline to prescribe and treat patients by mail. Diagnosis or treatment by mail is not scientific, and can never be satisfactory—Therefore—

#### WE REGRET THAT WE CANNOT—

Make a diagnosis by mail:

Prescribe medical treatment by mail.

Prescribe diets for sick individuals.

Tell an inquirer whom we have never seen whether he ought or ought not to have a surgical operation.

Predict the outcome of any treatment in any patient.

This statement, being a clear exposition of the magazine's editorial policy with regard to answering health inquiries, is a time-saver in that it makes lengthy explanations unnecessary. This is important in organizations where

large volumes of correspondence are handled daily.

Letterheads of other health agencies feature timely messages at various seasons of the year such as brief statements about precautions to take against colds or pneumonia during the winter months and how to avoid vacation hazards during the summer time. Such "healthograms," as one agency terms them, are very effective and when printed in colored ink add to the letterhead's appearance. Make the most of your margins—is our tip in this connection.

#### MAGAZINE ARTICLES

Recent popular magazine articles on health or of medical import:

"The ABC of Tuberculosis." Joseph D. Wassersug, M.D. *The American Mercury*, October, 1942.

"Is Everyone Allergic?" Joseph G. Lee, M.D. *Parents' Magazine*, September, 1942.

"Blitz Plague." John Kobler. *Saturday Evening Post*, August, 1942.

"Psychosurgery Cured Me." Harry A. Dannecker. *Coronet Magazine*, October, 1942.

"What's New in Color-Blindness." Gretta Palmer. *Coronet Magazine*, October, 1942.

"Plain Talk About Sterilization." Victor Hugo Boesen. *Coronet Magazine*, October, 1942.

"Sister Kenny Wins Her Fight." Lois Mattox Miller. *The Reader's Digest*, October, 1942.

"Front Lines of Surgery." Lois Mattox Miller. *The Reader's Digest*, October, 1942.

"The Story of Plasma." John Pfeiffer. *Harpers*, October, 1942.

"Doctor, Please Hurry!" Gretta Palmer. *Cosmopolitan*, November, 1942.

"A Chart on Vaccines." (No author listed.) *Good Housekeeping*, October, 1942.

"You and Your Vitamin A." Gene-

vieve Callahan. *Better Homes and Gardens*, October, 1942.

"Blood Donations." (No author listed.) *Ladies' Home Journal*, October, 1942.

"Your Life Expectancy." Louis I. Dublin. *The American Mercury*, July, 1942.

(The above is not presented as a complete list and the articles cited are not necessarily recommended.)

#### JOTTINGS

Health educators have never placed much stress on the control of bedbugs for the reason that they "have not been definitely incriminated as important natural vectors of any disease." However, it now appears that bedbugs may be the source of something more serious than mere discomfort. Recent research suggests that "the bedbug is the major vector in the natural epidemiology of lymphocytic choriomeningitis." (See the *Journal of the American Medical Association*—issue of August 22, 1942—Editorial Section.) The mosquito, recently incriminated in the transmission of certain types of encephalitis, is also not without suspicion as a factor in this variety of meningitis. . . . The New York Academy of Medicine (Medical Information Bureau) and the Board of Education of the City of New York conducted an intensive course in health education for 1,500 teachers during the summer vacation season. In the Academy's assembly hall, 4 hours a day, for 10 weeks, a faculty of 30 specialists reviewed basic points in the fields of communicable diseases, nutrition, home nursing, mental hygiene, and first aid. The course was designed to equip New York City school teachers as "health wardens," to spread information to other teachers, to pupils, to parents, opening up a "second front" in health education. . . . Personal nomination for the Book-of-the-Month: *Ambassadors in White*, by Charles

Morrow Wilson, published by Henry Holt and Company, at \$3.00 per copy. Here is a wholly absorbing account of the long battle for health in the Americas as waged by Finlay, Noguchi, Reed, and Gorgas. This book contains excellent descriptions of certain tropical maladies—"maladies that may cross the barricades of the most careful sanitary inspection and gain a foothold within our own borders." The author makes clear the importance of health control measures in relation to the full utilization and development of Latin America's great resources. . . . The comparatively neglected field of social medicine (not to be confused with "socialized medicine") is to be explored and studied at Oxford University, England. An Institute of Social Medicine has been created to deal with the environmental factors that undermine physical and mental well-being. Where sociologists and public health officials are concerned with humanity in the mass, this new institute will concentrate upon the individual person in order to discover how his life may be lengthened by removing the communal causes of disability. This is a new kind of preventive medicine and the institute's work deserves attention here where we have not yet taken full cognizance of such factors as city noise and smoke, the annoyances of family life, monotonous work, economic insecurity, and worry as causes of ill health. . . . A recent issue of the *Monthly Bulletin* of the North Carolina State Department of Health carries on the front cover a likeness of Dr. Milton J. Rosenau, Head of the Department of Public Health and Preventive Medicine at the

University of North Carolina. We heartily endorse the *Bulletin's* editorial comment that "Dr. Rosenau has done more for health education than perhaps any other person." . . . The New York State Department of Health has issued a number of publicity items on home and farm safety for the use of health officers. The material includes a series of news releases and suggestions for radio talks on important phases of the subject. Coming from an established safety agency this material would be considered routine, but it is exceptional, if not unique, to see it issued by a state department of health—marking as it does an important new development in the public health field. . . . A number of health films of exceptional quality have been issued by the Film Section of the British Information Services, 30 Rockefeller Plaza, New York, N. Y. Included among the subjects are pictures on blood transfusion, health during wartime, plastic surgery, the education of the blind, physical fitness, and diphtheria prevention. Information concerning these pictures is available from the agency at the address given above. . . . Some time ago we learned that Dr. H. E. Kleinschmidt had retired from the staff of the National Tuberculosis Association, and was enjoying a well earned rest. We join with others in hoping that we may soon again see him back in harness and in the front ranks of public health education during the war period. The times are too critical to afford the permanent loss of the unique skills and vast experience which Dr. Kleinschmidt possesses and which are so pertinent to the needs of the moment.

## BOOKS AND REPORTS

**School Health Problems** — By *Dorothy B. Nyswander, Ph.D.* New York: *The Commonwealth Fund*, 1942. 377 pp. Price, \$2.00.

If you were making a list of "must" reading for health officers, school superintendents, and directors of school health service, you would include this book. It presents the outcome and details of a four year intensive study of school health service in New York City dealing with "the effective utilization of organized effort for the better health of school children." The book makes a clear presentation of an important study by an able research staff under the direction of an impressive advisory committee.

The Department of Health and the Board of Education of New York City, as well as the professional people immediately concerned with the study, are to be congratulated upon the frank, scientific, and pioneering methods with which they undertook a study of administrative problems. They have studied the work of the school physician, the teacher, and the nurse. They have investigated such specific problems as follow-up, the testing of visual acuity, the testing for loss of hearing, obtaining dental care, the supervision of cardiac children, the relationship of private physicians to the school health program, and staff education.

In respect to all of these items the various elements of strength and weakness in the New York program have been analyzed. Many constructive procedures and technics in school health administration have been devised, tested, and recommended. The applications of the study are in no way restricted to New York City. The study represents the "laboratory" method

applied to school health administration. It deals with problems which are common to most school systems. It shows us how we can evaluate our present school health programs, and gives us many concrete suggestions for improving it.

C. E. TURNER

**So Build We**—By *Mary S. Gardner.* New York: *Macmillan*, 1942. 223 pp. Price, \$2.25.

*So Build We* presents in fictional form a series of episodes in the life of a public health nurse executive. Miss Mary Melton is just one of any number of nurses who come face to face with professional and human problems in their everyday work.

The story is alive and appealing. Out of her wide experience, the author gives much sound advice, but she succeeds in conveying this advice through a thoroughly entertaining story. Her extraordinarily fine sense of humor has not only contributed to the quality of this book, but it must also have been a strong factor in her successful career.

The book will be read by nurses who know Miss Gardner, with the feeling that they have had a personal conference with her and have benefited by her human, realistic analysis of fundamental social situations. Those who have not had the privilege of Miss Gardner's personal influence will feel the inspiration of a great leader and have the desire to emulate the thoroughly fine, unselfish devotion to service personified in the characters through whom she expresses her philosophy.

This book is a real contribution to public health nursing literature. It will serve a purpose which no other book on the subject meets. It should be read by student nurses, public health nurses,

physicians, health officers and lay persons interested in community service, and if one has no specialized interest in social programs it is, at any rate, a delightful novel. AMELIA H. GRANT

**Chemistry and Physiology of the Vitamins**—By H. R. Rosenberg. *New York: Interscience Publishing Company, 1942.* 674 pp. Price, \$12.00.

This book with 674 pages and almost 3,000 references is probably the most complete record of the work done in the field of vitamins up to 1942. The subject matter is systematically arranged and it is critically and comprehensively appraised from chemical, physiological, nutritional, and industrial points of view. Methods of preparation of the better known vitamins and the procedures for their determination by chemical and biological means are outlined in a clear, if somewhat abbreviated, form.

The discussion of the essential fatty acids, chlorine and related compounds, and the essential organic sulfur-containing compounds, which the author groups as the "vitagens," is appended to the main section of the book. The brief treatment given to the sulfur-containing amino acids, however, does not add to the excellence of the book. For instance, contrary to facts the author states that "there is actually ample experimental evidence that cysteine is synthesized in the organism from methionine without cleavage of the sulfur linkage." Actually no such direct evidence is admitted by the authors to whom Dr. Rosenberg refers in support of his statement.

In this age of high-pressure publicity, and in view of the somewhat confused state of vitamin affairs, Dr. Rosenberg's book should be heaven sent to teachers of biochemistry, nutritionists, clinicians, and even to vitamin-plagued laymen. It is neither dogmatic nor is it simply a historical survey of the field. The

author plainly states, after a critical survey of each topic, what could be considered as known, established, or doubtful, pending further work.

The book will undoubtedly undergo several editions in view of the dynamic state of the field of vitamins. The general plan of the work, however, is such that it will not grow out of date soon. In any case, the relatively low cost of the book is well worth the return.

J. A. STEKOL

**The Collected Reprints of The National Foundation for Infantile Paralysis — 1941 — Vol. II** — *New York: National Foundation for Infantile Paralysis, 1942.*

This thick volume, containing 57 reprints, is about twice the size of Vol. I, which also represented the published results of investigations which have been supported by grants from the National Foundation for Infantile Paralysis. As such, it becomes in some ways an annual report of the research activities supported by this Foundation; but the book performs other functions too, *viz.*: it is a fairly complete report of the recent (1941) advances in knowledge, arranged chronologically as of the date of publication, in the field of poliomyelitis, and it can be used as a handy reference volume for the bookshelves of anyone engaged in studying or writing on the subject of poliomyelitis, who wants to have certain of his current (1941) reprints under one cover. One can find in these pages most of the important trends regarding laboratory experimentation in this disease; in other words, what North American representatives of the medical profession have been doing about poliomyelitis, and what they have been thinking about, during the past year. This last statement deserves some qualification, for not all the laboratories and not all the groups of workers engaged in investigations on poliomyelitis in this country



and in Canada are supported by this Foundation, although the great majority of them are. If, for instance, one were to add the reprints of Howe and Bodian, of the Johns Hopkins Medical School, and the reprints of Aycock, of the Harvard Medical School, he would have a very representative annual list of the work done in this country.

As to the quality and caliber of the research which is reported in these papers, the reader can judge for himself. One might find half a dozen papers in the series which seem to be only remotely related to the field of poliomyelitis—such as: "The Effect of Quinine on the Metabolism of Fasting Dogs and Patients with Creatinuria," or "A Modification of Mallory's Phosphotungstic Acid-hematoxylin Stain for Formaldehyde-fixed Tissues." These titles may provoke a certain amount of pursing of the lips, but on closer study it will be found that they represent papers which are part of a series of studies which seem to have as their eventual aim something to do with poliomyelitis. On the other hand, there are at least some papers in this series which have a great deal to do with poliomyelitis.

It may be too soon to judge the actual significance of this most recent work, but to the reviewer it would seem that the advances made and reported in 1941, are above those of the average year. There are the excellent studies by Sabin and Ward, in which human autopsy material has been carefully tested for virus from a large series of fatal human cases, indicating as no other studies have ever done how there are *two* major sites of predilection in the human body (in the late stages of the disease) for the virus; namely, the central nervous system, and the lower bowel. There is the first (rather ultra-cautious) paper tending to voice acceptance of the Kenny treatment in this country—the harbinger of many papers to come. There is a series of papers

from the Hooper Foundation on equine encephalomyelitis of the Western type. This disease, like poliomyelitis, is a virus infection of the central nervous system, which is prone to occur in the summer; and the (1941) discoveries of Hammon, Howitt, and others, are included in this volume. Among these papers on encephalitis are reports of finding the virus of this disease in mosquitoes captured in the field, and of evidences of immunity (or at least neutralizing antibodies) in the blood of a great variety of species besides those of the horse and man. Such new facts yield a fund of information about a disease which may in all probability be closely related to poliomyelitis.

There is also an interesting feature with regard to the three papers dealing with the discoveries of the virus of poliomyelitis in flies captured during epidemic times. These three papers appeared within 60 days of one another, representing a rather striking example of a finding which was ready to be made.

The reviewer trusts that he voices the sentiments of many readers by stating that he hopes that these annual volumes may continue to appear. JOHN R. PAUL

*The Science of Health — By Florence L. Meredith, B.Sc., M.D. (2nd ed. of Twelve Hours of Hygiene). Philadelphia: Blakiston, 1942. 427 pp. Price, \$2.50.*

This is the second edition of a book previously entitled "Twelve Hours of Hygiene." It is intended for use as a textbook in "one-hour-one-semester" college courses in hygiene. The contents relate primarily to personal hygiene, although certain phases of vital statistics are dealt with in the introduction. An appreciation of the importance of community hygiene is omitted. Scientific explanations are given as far as possible, but much that must be included in a textbook of this character rests on belief. The contents are presented in great

detail, parentheses are used to excess, and awkwardly constructed sentences appear. "If no sterile goods are at hand, a clean handkerchief, or any soft, clean cloth may be ironed until slightly scorched and the scorched side, untouched by the hands or anything else after ironed, may be applied to a wound."

The author takes the view that much may be accomplished in college courses in hygiene through use of a comprehensive text, and she has made a special effort "to give facts usable by the student in making his own decisions in whatever circumstances he finds himself." This is an ambitious undertaking and accounts for the emphasis on details. Those subscribing to a similar teaching philosophy will be interested.

ADOLPH WEINZIRL

**W. K. Kellogg Foundation: The First Eleven Years—*Battle Creek, Mich.: Published by Trustees of the W. K. Kellogg Foundation, 1942. 217 pp.***

Readers of annual reports will have a unique experience in this report of the first eleven years of the W. K. Kellogg Foundation, relating the story of the Michigan Community Health Project and other ventures of this Foundation. It is a commendably forthright and readable account of purposes and fiscal affairs. But it is more than that.

An outstanding feature of the volume is the pictorial review of the work done under Foundation auspices in seven rural counties of Michigan. This attempt to portray the underlying principles of the work through pictures and their titles is eminently successful. As illustrations of the way in which a community can be organized for health, these pictures should be of service in showing the student of administrative practice how the educational approach can be used in all sorts of circumstances. It can serve as a reference work in a

variety of courses. If a student has any imagination it will be fired.

This report of the W. K. Kellogg Foundation belongs in the top flight group of outstanding foundation documents, along with annual volumes of the Commonwealth Fund and the Rockefeller Foundation, all of which have a public educational value beyond the strict limitations of the reports themselves.

REGINALD M. ATWATER

**Personal and Community Health—By C. E. Turner. (6th ed.) St. Louis: Mosby, 1942. 652 pp. Price, \$3.50.**

This text is planned for instruction of groups at the various college levels. The sixth edition contains 652 pages distributed as follows: 533 pages of discussion text arranged in 32 chapters; 78 pages reprinting the 1935 report of the committee of the American Public Health Association on the Control of Communicable Diseases; 9 pages of appendix discussing disinfection and disinfectants; 11 pages of glossary, and 20 pages of index.

It is well written and well printed, and the material is carefully selected and well balanced. The author has presented his discussions clearly and with conservative and considered judgment. The book has already won a deserved place in its field which the new sixth edition will help to maintain.

In a book which has so many fine qualities, one hesitates to comment adversely. There is one respect, however, in which the book is somewhat disappointing, namely the bibliography. It is true that a bibliography should cite the authority for statements when such citation is needed. In a text of this kind, however, it should provide suitable collateral reading wherein the student may find more extensive material than the text provides. Many of the subjects discussed are affected by recent

studies and the students rightfully expect the reference material to be reasonably recent. Of 238 references in the bibliography in which the date of publication was given, only 8 per cent were to articles published within the last five years, 92 per cent being to older literature. Forty-one per cent referred to articles published 6 to 10 years ago, and 42 per cent to those published 11 to 15 years ago. For its intended purposes, this useful book will be even more valuable if in future editions the revision extends to the bibliography.

M. E. BARNES

**Tuberculosis Sanatorium Directory**—By *National Tuberculosis Association, New York (1790 Broadway)*, 1942. 185 pp. Price, \$1.50.

The profession is again indebted to the National Tuberculosis Association for a comprehensive directory, the first to appear in four years. During this period the number of beds for tuberculosis in continental United States has increased to 97,726, a gain of 12 per cent, all of which has been among tax supported institutions. Private and semi-private institutions have shown a loss of 5 per cent in beds. In addition to the geographical list there are lists of federal sanatoria and hospitals, a list of mental hospitals making special provision for tuberculosis, and of penal institutions similarly making provisions. Tables show the number of institutions by states, the provision for children by states, the provision for Negroes by states, and the ratio of beds to deaths from tuberculosis by states. Altogether it is a very comprehensive and up-to-date directory.

REGINALD M. ATWATER

**Nursing: A Community Health Service**—By *Amelia. Howe Grant*. Philadelphia: Saunders, 1942. 277 pp. Price, \$2.50.

This book aims to meet the needs of

"graduate nurses preparing for public health nursing and for students in the basic nursing education programs of study."

The book is developed in three major units. Unit I starts with a brief review of the development and some of the present trends in the field of public health. This is followed by a discussion of public health nursing, its history, the organizations which are concerned with the administration of the service, and the major factors which characterize public health nursing as a family and community nursing service.

Unit II deals with the preparation of the nurse for effective service in this field. The importance of a good basic professional education, the programs of study in universities for the preparation of the graduate nurse in public health nursing, the qualifications for various positions as set forth by the National Organization for Public Health Nursing, and the program of staff education administered by the best public health nursing organizations are discussed carefully in this section.

In Unit III the special phases of public health nursing are reviewed as to their objectives, problems, policies of administration, nursing activities, and responsibilities.

Through *Nursing: A Community Health Service*, Miss Grant has contributed a book which will serve the needs of many groups and individuals. The instructor in the basic school of nursing will find it of value in interpreting the interrelationships between health and illness and the social factors which influence good nursing care. The graduate nurse interested in preparing herself for public health nursing will find a helpful guide in planning her preparation and a concise, yet comprehensive, survey of the major public health nursing services. The practitioner in the field will find the book of value, not only for herself, but as a

reference for lay workers who are interested in knowing more about the history, development and trends of a community service which they have long supported.

ELLEN L. BUELL

*Health Conditions, New York City, by Health Center Districts and Boroughs, Five Years, from 1936 to 1940—New York: New York Tuberculosis and Health Association, 1942. 30 pp.*

This handbook of health data presents recent mortality and morbidity reports in a manner to bring out areas of the city where special attention is needed as well as to give an over-all picture of vital statistics. Population changes due to natural increase and migration are analyzed, the marked variations indicating the importance of such basic data for constructive planning. With an average infant mortality rate of 34.9 in 1940, for example, the range among health districts was from 23.3 to 56.3. With an average tuberculosis mortality rate of 49, there was a range among health districts from 15 to 204, the range for boroughs being from 27 to 82. This invaluable source of basic information abounds in detailed statistical tables, is well illustrated with unusually effective charts, and continues a series which has long been valuable for administrative and teaching purposes.

IRA V. HISCOCK

*Physiological Hygiene—By C. P. Hickman, Ph.D. New York: Prentice-Hall, 1942. 482 pp. Price, \$3.25.*

This book is a frank effort to present modern medicine to college students. It is a miniature of almost the entire medical curriculum. No one thoroughly inured to the conventions and complexities of medicine would have had the hardihood to attempt its conception, development, parturition, and subsequent influence upon young men and women; that is, no one who had

been an active participant in the multitude of mistakes and the occasional successes which have attended medical progress.

The vital question which arises when one reads such a text is the accuracy with which the author portrays his offering to the innocents who must make it their gospel. Dr. Hickman is a Doctor of Philosophy, a zoölogist. This gives, perhaps, a certain intrepidity in approaching the entirety of human physiological experience which would be lacking in an ordinary doctor! For example, on page 161, dealing with "Circulatory Diseases," one reads "High blood pressure may run in families, and appear quite early in life." (Reviewer: This is true and very important in the examination of patients.) "This factor, however, appears to be a less common cause of arteriosclerosis than the second named." (Reviewer: *The second named* is, "wear and tear, abuse, the introduction of poisons into the system, and diseases.") "Good blood vessels may very easily acquire arteriosclerosis simply through their misuse." (Reviewer: This is emphatically untrue. No one knows how to misuse blood vessels wilfully.) "Alcoholism and syphilis are definitely known to be direct causes." (Reviewer: This is quite misleading. Alcoholism causes a wide complexity of human ills but not arteriosclerosis. Syphilis is permissible as a causative agent.)

Such criticisms may seem unduly condemnatory. There are many errors in the book, but who could write a text covering all of medicine and physiology without getting into trouble? It has one quality absent from most elementary books. Whether right or wrong, the student reader will want to know more! A textbook for college use that accomplishes such an end may be pardoned for errors incident upon too expansive a plan of presentation.

CECIL K. DRINKER

**The Life of Florence Nightingale**—By Sir Edward Cook. New York: Macmillan, 1942. 510 pp. Price, \$4.50.

The new edition of Sir Edward Cook's *The Life of Florence Nightingale* is peculiarly timely in view of the impetus which the present war has given to tropical medicine and to military medicine. Miss Nightingale's name is so identified with the founding of the profession of nursing that few are aware of her fundamental contributions to sanitation, military medicine, tropical medicine, medical statistics and nomenclature, and hospital construction and administration, all based upon her own experience in the military hospitals at Scutari during the Crimean War.

She was directly responsible for several inquiries into the health of the Crimean Army, the army at home, and the army in India, and contributed importantly to the findings and recommendations of the Royal Commissions appointed to deal with these matters.

She demonstrated conclusively that the medical morbidity and mortality rates among British troops at home stations, in the Crimea, and in India, were largely preventable. By the application of simple sanitary measures she greatly reduced the incidence of hospital-transmitted dysentery and typhus. She emphasized repeatedly that the one protection against cholera is sanitation.

She was responsible for the introduction of sanitation into the British Army, for the complete reorganization of the Army Medical Department and the Army Hospital system, for the establishment of the Army Medical School, and she it was who nominated the first faculty. She prepared a classification of disease and medical statistical forms which were made available to the medical department of the United States

Army at the request of the Secretary of War, during the Civil War. With ample justification she may be referred to as the mother both of military and of tropical medicine.

This biography is one which should be widely read by physicians, sanitarians, and medical students. It is readable and extensive. It is replete with direct quotations from personal letters, from the various Royal Commissions, and other original sources, which greatly enhance its historical value. A lengthy bibliography and a useful index are included.

THOMAS T. MACKIE

**Psychotherapy in Medical Practice**—By Maurice Levine, M.D. New York: Macmillan, 1942. 320 pp. Price, \$3.50.

This book is designed to give the general practitioner a survey of essential points dealing with the relationship of psychiatry and mental hygiene to the field of medicine. Its chapters comprise:

Common Misconceptions, Methods of Psychotherapy, Methods for the General Practitioner, Advanced Methods for the General Practitioner, Methods for the Specialist, Suicide Risks, The Study of Psychogenic Factors, The Choice of Cases, Sex and Marriage, Basic Attitudes Toward Children, The Problems of Parents and Children, and Normality and Maturity.

The writer gives clearly his views and their practical application in a common sense and readable form which should be of value to the audience for which the book is written. One hopes that the "audience" will read this book and not treat it merely as another volume to be added to their medical library.

ESTHER L. RICHARDS

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**About That Army Jaundice—** Most health workers will have to listen to discussions, or their opinions will be asked, about the late and lamented outbreak of jaundice among soldiers and sailors protected with yellow fever vaccine. It is well to be armed with the truth, and here you will find it, in a circular letter issued to all military medical officers. There is editorial comment on the subject in the same issue.

ANON. The Outbreak of Jaundice in the Army. *J.A.M.A.* 120, 1:51 (Sept. 5), 1942.

**Order from Administrative Chaos—** War has brought into prominence the lack of a unified system for medical care in Great Britain. The time has come, this committee report insists, to prepare for an organization to deal adequately and efficiently with medical care and health needs of the whole nation. American sanitarians, living in a land where health and medical services are even more Topsy-like in their hit-or-miss growth, will find much food for cogitation in the proposals outlined by the British Society of Medical Officers of Health.

ANON. A (British) National Health Service. *Pub. Health.* 55, 12:199 (Sept.), 1942.

**Raw Milk's Added Attraction—** Milk even when produced under acceptable sanitary conditions frequently contains hemolytic streptococci of human origin. Should you ever need it, here is new and convincing evidence with which to confront those raw milk enthusiasts who are aware that tubercle bacilli seldom are found in market milk these days.

BEAHM, E. H. A Bacteriological Study of the Streptococci Isolated from Raw Retail Milk. *Am. J. Hyg.* 36, 2:147 (Sept.), 1942.

**Repairing Air Raid Damage—** Have you water troubles on your mind? Has the wartime problem of safeguarding water supply to any part of your population been placed at your doorstep? Then you'll be very greatly concerned with this excellent report from bomb-damaged Britain. Following it are a half dozen worth while papers by American writers upon our own less tragic domestic difficulties.

BERRY, H. Water Supply in War-Time London. *J. Am. Waterworks Assn.* 34, 9:1298 (Sept.), 1942.

**Husbands and Wives Dying from Similar Causes—** One would anticipate that spouses of husbands or wives, dying of tuberculosis, influenza, or pneumonia, also would succumb to these communicable diseases at rates greater than the normal expectation. But that the phenomenon should hold true in the case of cancer, would seem hard to explain. Though no explanation is offered, another study (of a nation-wide sampling) confirms the findings of an earlier review of vital statistics of a single county.

CIOCCO, A. Data on the Concurrence of Death from Tuberculosis, Influenza and Pneumonia, Cancer, and Heart Diseases among Husbands and Wives. *Pub. Health Rep.* 57, 36:1333 (Sept. 4), 1942.

**Health Services in Boom Towns—** Built, or building, are 435,000 dwelling units to accommodate 1½ million tenants, a half-million of whom will be engaged in war work. The character of the sanitary, medical, nursing, and dental services furnished this group of essential workers will have a direct and decided effect upon the outcome of this war. Some of the problems incident to

supplying these health services are studied.

FREEDMAN, D. K. Health Problems in War Housing. J.A.M.A. 120, 1:9 (Sept. 5), 1942.

**Mothers and Babies in the War—**Care of expectant mothers among evacuees and wartime nurseries for the children of mothers engaged in war work are subjects that may some day arise to plague American administrators. Here then are three papers upon British experience.

GODDER, G. E., *et al.* Experiences in the Reception of Evacuee Expectant Mothers (and two related papers). Pub. Health. 55, 11:188 (Aug.), 1942.

**School Children in War-Time—**Hardly a school child but has been affected by the war. Homes have been disrupted, insanitary living conditions have increased, tensions have developed, and the schools find themselves out in front bearing the impact of these conditions. What the school nurse can do about this war-time problem is discussed.

GROUT, R. E. Nurse in War-Time School Health Program. Pub. Health Nurs. 34, 9:477 (Sept.), 1942.

**Why Must They Call It "Mess"?**—A recent *New Yorker* illustration portrays an inquisitive old lady asking a surprised soldier how many greens he is fed each day. Perhaps you, as an "expert" in all matters of health, are asked about the army and navy rations by worried mothers and dubious fathers of boys in the service. Well, here is the factual material which will enable you to answer them intelligently.

HOWE, P. E. Nutritional Aspects of Feeding an Army (and) BROWN, E. W. Nutritional Aspects of Feeding in the United States Navy. J.A.M.A. 120, 2:93 (Sept. 12), 1942.

**Anent Grandma's Chronic Bronchitis—**All case finding methods should be applied vigorously to the search for tuberculosis among older people. If

you want evidence that there are still many undetected cases of chronically infectious tuberculosis in the higher age groups you'll find it in this paper.

MILLER, R. E., and HENDERSON, B. Undiagnosed Pulmonary Tuberculosis in Elderly Persons. Am. Rev. Tuberc. 46, 2:164 (Aug.), 1942.

**In Our War against Influenza—**Experimentally, it is provable that both ultra-violet radiation and propylene glycol vapor will prevent certain airborne infections with influenza A virus. Experimentally, it has been found that highly concentrated egg-fluid virus vaccine will give some protection against influenza A infection. Immune serum also protects, under the controlled conditions described. Are we, therefore, ready to meet the next pandemic of influenza? Certainly some weapons are available. Time will determine the completeness of our armamentarium.

STOKES, J., JR., and HENLE, W. Studies on Methods of Prevention of Epidemic Influenza. J.A.M.A. 120, 1:16 (Sept. 5), 1942.

**About Blood Banks—**If you are making your blood donations every 8 weeks, as you should—assuming that you're healthy and under age 60—you'll be doubly interested in this report upon the conduct of the blood banks. If you haven't yet begun your regular "deposits" in this most important of all banks you'll begin as soon as you read this reassuring paper.

TAYLOR, E. S. Procurement of Blood for the Armed Forces. J.A.M.A. 120, 2:119 (Sept. 12), 1942.

**Criminal Negligence Department—**Just as a reminder that children still die needlessly of diphtheria, this report is worth noting. Of the diphtheria cases admitted in three years to the Los Angeles County General Hospital, 36 went to their death. What complications they died of and why is the point of this study.

TOGASAKI, Y., *et al.* Treatment, Complica-

tions and Deaths in 753 Cases of Clinical Diphtheria. *Am. J. Med. Sci.* 204, 2:218 (Aug.), 1942.

Out from the Rut—Effective use of the limited professional services available for school health supervision is a subject which should be of interest to health workers even in communities where the problem is one solely for the educational authorities. This story of the Astoria (N. Y.), School Health Study drives home the point that precious professional services must not be wasted upon outmoded practices.

WHEATLEY, G. M. Health for Tomorrow's School Child. *Pub. Health Nurs.* 34, 9:483 (Sept.), 1942.

An Old Problem in a New Setting—Some of the inherent difficulties in following up persons rejected by draft boards and the army doctors because of tuberculous lesions are enumerated.

It is pointed out that this is potentially the one greatest case finding opportunity in the history of the disease.

WILLIAMS, C. J. The Tuberculous Registrant. *Am. J. Nurs.* 42, 9:989 (Sept.), 1942.

Alteram Partem, Audire—Although there is a direct and statistically significant increase in tuberculosis among the husbands or wives and brothers or sisters, of persons dying of tuberculosis the negative findings must not be overlooked: 83 per cent of the spouses and 86 per cent of the siblings did not die of tuberculosis though exposed for many years. Quite evidently there is a constitutional element as well as the factors of specific infection and social environment which influences the spread of tuberculosis.

WOLFF, G., and Ciocco, A. Infection, Social Environment, and Heredity in Tuberculosis. *Am. Rev. Tuberc.* 46, 2:142 (Aug.), 1942.

## BOOKS RECEIVED

PUBLIC HEALTH STATISTICS. By Marguerite F. Hall. New York: Hoeber, 1942. 408 pp. Price, \$5.50.

ELEMENTS OF HEALTHFUL LIVING. By Harold S. Diehl. New York: McGraw-Hill, 1942. 322 pp. Price, \$1.75.

INTRODUCTION TO PARASITOLOGY. By A. S. Pearse. Springfield: Thomas, 1942. 357 pp. Price, \$3.75.

BLOOD SUBSTITUTES AND BLOOD TRANSFUSION. Edited by Stuart Mudd and William Thalheimer. Springfield: Thomas, 1942. 407 pp. Price, \$5.00.

MEDICAL PARASITOLOGY. By James T. Culbertson. New York: Columbia, 1942. 285 pp. Price, \$4.25.

AFTEREFFECTS OF BRAIN INJURIES IN THE WAR. By Kurt Goldstein. New York: Grune & Stratton, 1942. 244 pp. Price, \$4.

EAT WHAT YOU WANT! A Sensible Guide to Good Health through Good Eating. By W. W. Bauer and Florence Marvynne Bauer. New York: Greenberg, 1942. 263 pp. Price, \$2.00.

CONTRACEPTION AND FERTILITY IN THE SOUTHERN APPALACHIANS. By Gilbert Wheeler Beebe. Baltimore: Williams & Wilkins, 1942. 274 pp. Price, \$2.50.

GROUP DIFFERENCES IN URBAN FERTILITY. By Clyde V. Kiser. Baltimore: Williams &

Wilkins, 1942. 284 pp. Price, \$2.50.

THE LIVES AND LOVES OF HUBER THE TUBER. By Harry A. Wilmer. New York: National Tuberculosis Association, 1942. 83 pp. Price, \$1.00.

THE AMATEUR SCIENTIST. By W. Stephen Thomas. New York: Norton, 1942. 291 pp. Price, \$3.00.

MINERALS IN NUTRITION. By Z. T. Wirtschafter. New York: Reinhold, 1942. 175 pp. Price, \$1.75.

FORMULARY FOR USE IN MILITARY HOSPITALS. London: His Majesty's Stationery Office, 1942. 37 pp. Price, \$30.

HEALTH FACTS FOR COLLEGE STUDENTS. By Maude Lee Etheredge. 4th ed. Philadelphia: Saunders, 1942. 379 pp. Price, \$2.25.

SUPPLEMENT "D" TO OHIO RIVER POLLUTION SURVEY REPORT OF THE U. S. PUBLIC HEALTH SERVICE. Cincinnati: Federal Security Agency, 1942. Supply limited.

NASSAU HEALTH IN 1941. Third Annual Report of the Nassau County Department of Health for the Year Ending December 31, 1942. 1942.

FOOD CONSUMPTION AND DIETARY SURVEYS IN THE AMERICAS. Results—Methods. By Robert Morse Woodbury. Montreal: International Labour Office, 1942. 64 pp. Price, \$35.



## APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

### *Health Officers Section*

- David R. Barglow, M.D., Westcliffe, Colo., Public Health Officer  
John Y. Battenfield, M.D., M.P.H., Station Hospital, Sheppard Field, Tex., Medical Associate, National Society for Prevention of Blindness  
John A. Connelly, M.D., City Hall, Room 214, Trenton, N. J., Health Officer  
Luis Falagan-Gonzalez, M.D., P. O. Box 327, Mayaguez, Puerto Rico, Health Officer  
Olaf Haraldson, M.D., 215 Fifth Ave., N.W., Minot, N. D., Director, Minot-Ward Health Unit  
Charles S. Haygood, M.D., 218 North Philadelphia, Shawnee, Okla., Health Director, Pottawatomie City-County Health Dept.  
Henry C. Huntley, M.D., Atoka County Health Dept., Atoka, Okla., Director  
A. Fernos Isern, M.D., Commissioner of Health, Dept. of Health, San Juan, Puerto Rico  
Lee D. Janis, M.D., Eddy County Courthouse, Carlsbad, N. M., Director of Venereal Disease Control, State Dept. of Public Health  
G. T. Parkinson, M.D., Box 572, Twin Falls, Ida., Asst. Medical Officer, South Central Dist. Health Unit  
Willie B. Trammell, M.D., Lawrenceville, Ga., Commissioner of Health, Gwinnett County Health Dept.  
Elizabeth I. Workman, M.D., 98 N. Sandusky St., Delaware, Ohio, Health Commissioner, Delaware City-County Health Dept.

### *Laboratory Section*

- Harold W. Batchelor, Ph.D., Ohio Agr. Experiment Station, Wooster, Ohio, Microbiologist  
Lilly C. Johnson, 62 Hamilton St., Hartford, Conn., Laboratory Technician, State Dept. of Health  
Paul A. Little, M.S., Lederle Laboratories, Inc., Pearl River, N. Y., Bacteriologist  
John J. Shank, B.S., 17 E. Main St., Waynesboro, Pa., Chemist and Bacteriologist, Borough of Waynesboro  
Marie J. Vandenberg, A.B., 1752 Solano Ave., Berkeley, Calif.

### *Vital Statistics Section*

- Major George D. Williams, M.C., Office of the Surgeon General, Division of Vital Records, U. S. Army, Washington, D. C.

### *Engineering Section*

- Arve H. Dahl, M.S., P. O. Box 947, Alexandria, La., Asst. Public Health Engineer, U. S. Public Health Service  
Price E. Griffith, Dept. of Public Health and Welfare, Fort Worth, Tex., Supervisor, Food and General Sanitarians  
Arthur C. L. Jetley, B.S., 1217 Pearl St., Jacksonville, Fla., Head Supervisor in Florida, Malaria Control in War Areas, U. S. Public Health Service  
Thomas L. Page, 52 Frank St., Stamford, Conn., Sanitary Inspector, City of Stamford  
Ralph Porges, B.S., U. S. Typhus Control Unit, 41 Exchange Place, Atlanta, Ga., Asst. Sanitary Engineer  
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### *Industrial Hygiene Section*

- Robert M. Graham, M.D., 79 E. Adams St., Chicago, Ill., Director, Dept. of Sanitation and Surgery, The Pullman Co.  
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Clifford Kuh, M.D., Dr.P.H., 2002 Acton St., Berkeley, Calif., Chief, Bureau of Industrial Health, State Dept. of Public Health  
Emily M. Smith, B.S., State Dept. of Public Health, Nashville, Tenn., Industrial Nursing Consultant

### *Food and Nutrition Section*

- Laura K. McCrory, Ph.B., 415 Hannifin, Bismarck, N. D., Nutrition Consultant, State Dept. of Health  
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Mary S. Stansel, M.S., State Board of Health,  
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State Board of Health

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Marie A. Boden, 1628 Hillview Place, St.  
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tion and Rehabilitation, Connecticut Tuber-  
culosis Assn.

Frances G. Hoffman, Council of Social Agen-  
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retary of the Health Division

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Health Nurse, State Dept. of Health

Lois E. Howorth, B.S., State Dept. of Health,  
Smith Tower, Seattle, Wash., Advisory  
Public Health Nurse

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Teachers College, Columbia Univ., New  
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Lucia Massee, Carnesville, Ga., Franklin  
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Dept. of Public Health

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*Epidemiology Section*

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Woodstock, Ill., Asst. Surgeon (R), U. S.  
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Robert L. Vought, M.D., M.P.H., 501 Hotel  
Jamestown Bldg., Jamestown, N. Y., Dis-  
trict Health Officer, State Dept. of Health

*Unaffiliated*

Charles B. Frasher, M.A., Room 207, Black-  
stone Bldg., Harrisburg, Pa., Merit System  
Supervisor, State Dept. of Health

DECEASED MEMBERS

N. M. Burnett, M.D., Lamar, Colo., elected  
member 1919—Unaffiliated

Dorothea Campbell, Charleston, W. Va.,  
Elected Member 1929, Public Health Edu-  
cation Section

## EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York, N. Y.

### U. S. CIVIL SERVICE COMMISSION

The Commission has announced again its need for public health nursing consultants in war work. The new announcement now provides for 5 grades and for appointments in the Children's Bureau, Department of Labor, U. S. Public Health Service, and Federal Security Agency. Salaries range from \$2,600 to \$5,600 a year. No age limits have been set. Positions exist both in the United States and foreign countries. War service appointments will be made to extend generally for the duration of the war and no longer than 6 months afterward. Duties are to carry out, in accordance with the rank of the position, nursing or nursing education programs; and to act in advisory capacity to Federal agencies, or to State, County, and municipal organizations.

There will be no written test, qualifications being judged solely from review of experience, education, and training of applicants. Persons applying must have completed a 4 year course in a recognized college and 1 year's special program of study in public health nursing approved by the National Organization for Public Health Nursing; must also have graduated from an accredited school of nursing affiliated with a hospital having a daily average of 100 or more bed patients; be registered nurses in a state or territory of the United States or the District of Columbia, and have had appropriate general public health nursing supervisory experience. Additional credit given for completion of approved college course in statistical analysis, public health nursing, supervision, social hygiene, tuberculosis control and maternity, pediatric or orthopedic nursing; also for certain appropriate experience as instructor, consultant, or investigator.

For positions in Children's Bureau

additional progressive experience in specialized fields of maternal or child health is required for the top grade and may be substituted for part of the general experience prescribed for the other grades.

Applications must be filed with the U. S. Civil Service Commission, Washington, D. C., and will be accepted until the needs of the service have been met. Forms may be obtained direct from the Commission or at any first or second class post office.

Merit System Council, Oregon State Board of Health and Crippled Children's Division, has announced merit examinations in practically all professional public health fields, including Health Officers, Nurses, Sanitary Engineers, Laboratory Workers, Vital Statisticians, Consultants in the fields of Health Education, Hearing and Vision, Nutrition, Oral Health and Physiotherapy. Two clerical positions, Fiscal Worker and Administrative Clerk are included in this list as is also the position of Merit System Personnel Technician.

Interested persons may get full particulars regarding the positions and examinations by writing H. J. Sears, Merit System Supervisor, P. O. Box 88, Portland, Ore.

The Indiana State Personnel Division, 141 South Meridian Street, Indianapolis, announces that applications may be filed at any time until further notice for the following positions:

Orthopedic Nursing Consultant I (women only) ..	\$150-200 mo.
Physician I (General) .....	165-250 mo.
Physician II (General) ....	250-325 mo.
Physician II (Tuberculosis)	250-325 mo.
Physician I (Psychiatric) ..	185-265 mo.
Physician II (Psychiatric) ..	250-325 mo.
Local Public Health Director .....	300-360 mo.

### POSITIONS AVAILABLE

Western state department of health will consider applications from physicians to fill four existing vacancies among county health officers, one vacancy in venereal disease control and positions as

laboratory technicians. Write Box S, Employment Service, A.P.H.A.

Physician with either public health training or experience in local health de-

partment administration to serve as health director in a county or district health department in midwestern state. Salaries vary from \$4,000 to 4,500 with \$500 to \$600 travel, flat rate. These are well established health departments. Write Box T, Employment Service, A.P.H.A.

County Public Health Nurses for New Mexico. Must have 4 months' postgraduate instruction under one of the recognized public health nursing courses and 1 year's experience. Must drive and have a car. Address inquiry to State Health Department, Santa Fe, N. M.

Wanted: Supervisor of generalized public health nursing staff of 6 to 8 nurses. Beginning salary \$175 per month, with opportunity for increase to \$220 and travel expenses. Must be high school graduate, graduate of hospital of 100 beds, and must have at least 1 year's postgraduate study in public health nursing at a recognized institution, and 2 years' experience in general public health nursing under qualified supervision. Apply Box L, Employment Service, A.P.H.A.

Southern state department of health seeks several obstetric and pediatric consultants, requiring a minimum of a year's residency in a specialty, immunity to draft, and preferably training in public health. Men and women are eligible. Salary \$300 per month plus travel. Apply Box C, Employment Service, A.P.H.A.

Bacteriologist with Ph.D. or equivalent and teaching experience wanted in western state university. Must be immune to military service call. Salary about \$2,500. Write Box A, Employment Service, A.P.H.A.

Two physicians, immediate appointment, full-time venereal disease clinician conduct several small clinics rotating schedule. Experience preferred. Salary \$3,000 to \$3,600 plus actual expense not to exceed \$1,200. Write State Health Department, Santa Fe, New Mexico.

Wanted: Chemical or Ceramic Engineer or Geologist for Occupational Disease work, Division of Industrial Hygiene, State Board of Health, Raleigh, N. C.

### THE AMERICAN RED CROSS NEEDS EDUCATORS

The American Red Cross will employ hundreds of social welfare workers and educators before January, 1943. These new employees will perform Red Cross services to the military units both in this country and with the task forces abroad.

Red Cross workers give counsel to the men in the armed forces about their personal and family problems, plan and organize recreational activities. They interpret Red Cross service to the military authorities. They act, to quote U. S. Army regulations, "in matters of voluntary relief and in accord with the military and naval authorities as a medium of communication between the people of the United States of America and their Army and Navy."

New professional employees needed include:

Men—Field directors, to serve at the military and naval centers here and abroad to counsel and advise men in the service regarding personal and family problems.

Men and Women—Club directors, program directors, staff assistants to operate clubs in leave areas overseas, some who qualify through executive or administrative experience, others by experience comparable to the operation of a large community center, and still others who qualify through recreation training and experience.

Men—Assistant field directors for recreation, to serve with the task forces overseas, qualified to plan, organize, and promote recreational activities such as sports, games, social recreation, entertainments, arts and crafts, music, dramatics, and game rooms.

Women—Medical and psychiatric social workers, case workers and recreation specialists in military and naval hospitals both here and abroad.

Men and women assigned to the service in this country will receive from \$135 to \$200 per month; those stationed outside the United States receive from \$150 to \$275 plus an additional \$50 per month maintenance allowance in military centers and full maintenance in club work. Uniforms are provided. Those assigned abroad are also provided with certain insurance protection.

Those interested in receiving further information or in making application for a position in the American Red Cross Services to the Armed Forces program should communicate with: Personnel Service, National Headquarters, American Red Cross, Washington, D. C.

Those interested in a position within continental United States only should apply to the nearest Red Cross area office. They are as follows:

North Atlantic Area, 300 Fourth Avenue, New York, N. Y.  
Eastern Area, 615 N. St. Asaph Street, Alexandria, Va.  
Midwestern Area, 1709 Washington Avenue, St. Louis, Mo.  
Pacific Area, Civic Auditorium, San Francisco, Calif.

THE AMERICAN NATIONAL RED CROSS  
WASHINGTON, D. C.

### MEDICAL OFFICERS NEEDED—TENNESSEE VALLEY AUTHORITY

The Tennessee Valley Authority is in urgent need of medical officers who are not eligible for military service and who are willing to accept assignments to war industrial activities (construction, manufacture of war chemicals and manufacture of hydroelectric power) as their participation in the all out war effort. Responsibilities include physical examinations, industrial hygiene, care of injuries, medical care to families in remote construction areas and general public health responsibilities in construction camps and villages.

Salary ranges from \$3,200 to \$4,200 per annum with opportunity for promotion.

For further information write to Dr. E. L. Bishop, Director of Health, Tennessee Valley Authority, Chattanooga, Tennessee, or to the Personnel Department, Tennessee Valley Authority, Knoxville, Tenn.

Physician, man or woman, as director of division of maternal, child and school hygiene in southern city department of health. Woman physician with pediatric training preferred, public health experience not essential. To operate prenatal, infant and preschool clinics and promote school health program. Salary commensurate with ability and qualifications of applicant. Apply Box J, Employment Service, A.P.H.A.

The New Mexico State Department of Public Health will consider applications for the position of obstetrical consultant, Maternal and Child Health Division. Address inquiries to the State Department of Public Health, Santa Fe, N. M.

Public Health Engineer and director of Division of Sanitation of a city and county health unit; population 145,000 in the midwest. Salary, \$3,180 and travel allowance. Box E, Employment Service, A.P.H.A.

The Alaska Merit System announces the following positions:

<i>Position</i>	<i>Salary per month</i>
Assistant Commissioner of Health.....	\$500 to \$625
Maternal and Child Health Director.....	380 to 455
Director, Division of Public Health Engineering.....	290 to 335
Sanitarian, Senior Grade.....	215 to 245
Sanitarian . . . . .	185 to 215
Bacteriologist, Senior Grade.....	290 to 335
Bacteriologist, Junior Grade.....	215 to 245
Laboratory Technician . . . . .	185 to 215
Public Health Nurse.....	185 to 215

Appointments are being made on a provisional basis with examinations following when the staff is more adequately completed.

Apply to W. H. Matthews, Jr., Alaska Merit System, Box 201, Juneau, Alaska.

### POSITIONS WANTED

#### ADMINISTRATIVE

Teaching or administrative position desired by physician, aged 48. Experienced teacher in preventive medicine and public health, now employed at prominent medical school; 20 years' experience in municipal health administration and epidemiology. A-491

Physician with 25 years' full-time experience in public health administration is

available for immediate appointment. Moderately hard of hearing; otherwise fully able. Salary \$4,500 or better. A-497

Physician, M.D., C.P.H., aged 47, seeks position in administrative work. Experienced in venereal disease control and industrial medicine. A-485

Physician, aged 47, M.D., Creighton

University, M.S.P.H., Michigan, experienced in school health and as director of county health unit, seeks position as administrator in state or local health department. A-498

Physician with 8 years' experience desires public health position preferably in urban locality. Age 45. Available now. A-502

#### WOMEN PHYSICIANS TRAINED IN PUBLIC HEALTH

Woman, aged 34, M.D., University of Basle, Switzerland, M.S.P.H., DeLamar Institute, Columbia University. U. S. citizen. Excellent references. Especially interested in industrial hygiene. A-493

Woman, aged 41, M.D., Columbia University, M.S.P.H., DeLamar Institute, experienced in epidemiology and research, seeks position offering administration experience. A-494

Woman physician, M.D., Rush, M.P.H., Michigan, 13 years' experience in school medical service and administrative county health unit, seeks administrative position. New York area preferred. A-500

Woman physician, aged 29, M.D. Women's Medical, M.P.H. Johns Hopkins. Specially interested in industrial medicine and public health administration. Has had residency in tuberculosis. A-501

#### HEALTH EDUCATION

Woman with master's degree in health education, 12 years' successful experience in public school and college teaching, administration and research. Will consider

position in normal school, public schools, or in official or nonofficial health agencies. Prefers South or East. Available at once. H-501

#### INDUSTRIAL HYGIENE

Industrial hygiene chemist. Experienced in sampling, analysis of toxic industrial gases and fumes; petrographic dust analysis; dust counting; general toxicological analysis; chemical microscopy; also experienced in making industrial hygiene surveys, with knowledge of German, French, and Spanish. Six years' experience. Desires position. I-457

#### LABORATORY

Man, aged 28, A.B., M.S. in animal parasitology, Ph.D. in human parasitology and tropical diseases. Two years' experience in charge of parasitological diagnosis and research in state laboratory. Research publications; teaching experience. Desires teaching position in university with opportunity to do research. L-463

Physician, B.S., M.D., 17 years' experience as director of public health laboratory, desires similar position or as administrator of division of an aggressive state health department. Experience covers investigational and control activities on water, several types of foods as chemist, and bacteriologist and serologist in syphilis and enteric diseases. L-465

#### MISCELLANEOUS

Public Health Nurse with M.A. degree wishes position in health supervision and teaching in college or public school. West preferred. M-452

# NEWS FROM THE FIELD

## FOR OUR CHILDREN IN WARTIME

### *A Program of State Action*

*Adopted August 28, 1942, by the Children's Bureau Commission on Children in Wartime in consultation with the Office of Defense Health and Welfare Services and the Office of Civilian Defense*

CHILDREN are the strength of the nation. In war as in peace, their welfare is of primary importance to the nation, to states, to local communities, and, above all, to parents.

Certain nation-wide needs must be met through nation-wide action, with the participation of federal, state, and local governments, and citizens' groups. Upon the states rests the chief responsibility for the provision of legal safeguards and administrative measures necessary to assure security and opportunity for every child.

The Children's Charter in Wartime calls upon all citizens as a wartime responsibility to guard children from injury in danger zones; to protect children from neglect, exploitation, and undue strain in defense areas; to strengthen the home life of children whose parents are mobilized for war or war production; and to conserve, equip, and free children to take their part in democracy.

The same emergency needs do not exist in every state or in all communities of the same state. One state or community must give first attention to protection of children in danger zones and advance planning for evacuation; in another, day care of children of mothers employed in war industries may be the most urgent immediate need; and in another, the welfare of children in "boom" towns and trailer camps.

The specific aspects of child life most in need of attention under wartime conditions must be determined state by state and community by community.

Certain problems, however, are so closely related to the war situation that nation-wide measures are required, developed through state and local action, with federal participation when necessary.

### *A. The Program*

In every state a program of action FOR OUR CHILDREN IN WARTIME should include measures which will assure:

1. Health service and medical and dental care for mothers and for children, including boys and girls in the age groups that may soon be called upon for war production or military service, with special provision as needed for wives and children of service men and war workers. These services should be so organized as to overcome or compensate for overcrowding of existing health facilities, shortages in medical and nursing personnel, and difficulties in transportation.
2. Adequate nourishing food for all children during the period of rising costs of living and rationing of food supplies, through such means as nutrition education, school lunches, and low-cost milk.
3. Protection of children in danger zones, including provision for their safety in the event of enemy attack; measures for emergency care following attack; and preparation through officially established evacuation authorities for evacuation and reception care, if necessary.

4. Day care for children of mothers whose employment is essential to the war program.
5. Special assistance programs as required to meet wartime needs of children in their own homes, and adjustment of public-assistance measures to meet problems due to rising cost of living, migration, and separation of families.
6. Community child welfare and other social services that will conserve home life for children and safeguard them from neglect and juvenile delinquency resulting from wartime conditions, and provide appropriate care for unmarried mothers and their children.
7. Adequate provision for the care of children who because of war conditions must be separated from their families.
8. Opportunities for recreation and other experiences in home and community life that will help children overcome wartime strain and insecurity; and provision for mental health services to help children and parents make the adjustments required by war conditions.
9. Full school attendance and school opportunity for every child, with particular emphasis on overcoming or compensating for shortages of schools and teachers where they exist, and with adjustments as necessary to conform with child labor and youth employment policies.
10. Meeting the man power needs of the nation for participation of young people in war production, having due regard for conservation of health and educational opportunity for youth and in accordance with the following principles:
  - (1) No child under 14 years of age a part of the hired labor force
  - (2) None under 16 employed in manufacturing or mining occupations
  - (3) None between 14 and 16 employed in other occupations that involve release from school or readjustment of school programs unless it has been determined that labor shortages cannot be met otherwise
  - (4) Guidance of youth 16 to 18 years of age whose work is essential to the war effort into occupations suited to their age and capacity, in which they can make the greatest contribution with the least hazard to their own health and safety

#### *B. Procedure for Carrying Out the Program*

The following steps will be necessary

to put into operation a program of action FOR OUR CHILDREN IN WARTIME:

#### *I. Organization—*

1. Fixing responsibility for planning, co-ordination, and leadership on some representative state group. Wherever practicable this group should be a committee or subcommittee of the council of defense, whose work should be properly related to the work of other defense council committees including those dealing with emergency and protective measures.
2. Inclusion in the state committee of representatives of state departments of welfare, health, education, and labor, and of state-wide organizations concerned with children; especially, representatives of active State White House Conference committees and other groups having a similarly broad purpose, with provision for full coöperation with such groups.
3. Organization of a representative local committee, when practicable as part of the local defense council.

#### *II. Putting the program into action*

1. Review of wartime needs of children and existing resources for meeting those needs, with special consideration of the 10 points listed under section A.
2. Development of state and community services adequate to meet the wartime needs of children with such financial assistance from the state or the federal government as may be required. The following measures will be necessary to achieve this objective:
  - (a) State legislation as needed to provide an adequate legal basis for wartime services for children.
  - (b) Review of adequacy of funds available from federal, state, and local sources, public and private, and securing of such additional funds as may be required.
  - (c) Review of administrative and personnel problems of state and local agencies responsible for services to children and families, and support of plans for strengthening the work of these agencies and developing closer coördination of agency programs.
  - (d) Assistance in developing and carrying out plans for recruitment and training of additional personnel, both professional and volunteer, as required.



### "PROFESSIONAL NURSING AND AUXILIARY SERVICES"

A new pamphlet with the above title covering preparation for all types of nursing services in concise form and prepared by the Nursing Information Bureau of the American Nurses' Association, has just been released.

Emphasis is placed on preparation for professional nursing and on the opportunities created by the war and its probable aftermath. Tables showing the wide variety of positions open to nurses as they advance in preparation and experience, and indicating the salaries which the various positions may command is a unique feature of the publication. A section on auxiliary nursing covers positions outside of professional nursing for persons working in civilian hospitals, clinics, dispensaries, or elsewhere as volunteer nurses' aides.

The pamphlet will be of interest to college and high school counsellors in helping young people to plan their future and to young nurses on the threshold of their careers. It may be obtained from the Nursing Information Bureau, American Nurses' Association, 1790 Broadway, New York, N. Y., at 25c.

### INSTITUTE ON PERSONALITY DEVELOPMENT

The Progressive Education Association, New York, N. Y., has announced the academic schedule for the year 1942-1943 of the Institute on Personality Development. According to the Association, the purpose of the Institute is to provide advanced training in guidance and mental hygiene for workers in education and the related fields of pediatrics, social work, and school health. An informal forum is provided where professional workers from various disciplines can exchange their experiences and advance their understanding and appreciation of those distinct specialties which lie outside their respective fields

but which deal with aspects of human growth and development. The group is limited to men and women who have had successful experience as teachers, school administrators, school psychologists, school health workers, pediatricians, psychiatrists, child guidance workers, or social workers. A bulletin of information may be obtained by addressing the Executive Secretary, 17 East 96th Street, New York, N. Y.

Among the Board of Trustees of the Institute are included Caroline B. Zachry, Ph.D., Leona Baumgartner, M.D., Frank J. O'Brien, M.D.; among the Leaders and Consultants, Benjamin Spock, M.D., Milton J. E. Senn, M.D., Mary Shattuck Fisher, Ph.D., Martha Eliot, M.D., Helen Merrell Lynd, Margaret Mahler, M.D., and George M. Wheatley, M.D.

### PAN AMERICAN SANITARY CONFERENCE IN RIO

The Eleventh Pan American Sanitary Conference was held during September in Rio De Janiero, with representation from most of the American republics. Hugh S. Cumming, M.D., was reelected Director of the Pan American Sanitary Bureau.

Among those in attendance from the United States were Thomas Parran, M.D., Surgeon General, U. S. Public Health Service, Washington, and Abel Wolman, Dr.Eng., Professor of Sanitary Engineering at Johns Hopkins School of Hygiene and Public Health, Baltimore.

### OIL SHORTAGES COMPLICATE CUBA'S SANITATION

The press on September 18 carried dispatches from Havana indicating that the shortage of oil has prevented the burning of large quantities of garbage with resulting increase in the number of flies. It was said that lack of petroleum also has halted customary measures against mosquitoes, and that the collection of garbage was difficult be-

cause of the lack of tires and gasoline.

It was said that an infantile paralysis epidemic now current was suspected of having relationship with these sanitary nuisances.

#### STANDARD OF ALLOWABLE CONCENTRATIONS OF MANGANESE

The American Standards Association, New York, N. Y., has announced the completion and approval of the American War Standard of Allowable Concentration of Manganese—Z37. 6—1942. This standard has been set up through the activities of A.S.A. Committee on Toxic Dusts and Gases. A standard for cadmium, Z37. 5—1941, was the first in the series and the report on manganese is the second. The standard was prepared by the staff of the U. S. Public Health Service and was reviewed by the A.S.A. committee. It will be effective during the war period, after which it will be reviewed by the A.S.A. committee and either withdrawn or revised if necessary and reapproved. The representative of the American Public Health Association on the responsible committee has been J. J. Bloomfield, Chief of the States Relations Section, National Institute of Health. William P. Yant has been chairman of the committee.

#### DR. WALTER BROWN APPOINTED PROFESSOR AT BERKELEY

The appointment of Dr. Walter H. Brown of Stanford University as Chairman of the Department of Hygiene at the University of California, Berkeley, has been announced. According to *Western Public Health*, Dr. Brown agreed to change his affiliation from Stanford, where he has taught for the past 15 years, to the University of California with the express understanding that his services were needed to prepare the way for a school of public health.

Three months ago the Northern California Public Health Association appointed a committee for the establish-

ment of a school of public health on the West Coast. Members of the committee included Fred T. Foard, M.D., Bertram P. Brown, M.D., Charles Edward Smith, M.D., Karl F. Meyer, Ph.D., W. Ford Higby, Lawrence Arnstein and W. P. Shepard, M.D., Chairman. The committee has made definite proposals to the University of California and has prepared a tentative budget. Interest has been shown by the authorities at the University of California, and the committee is preparing to sponsor a bill in the 1943 California Legislature to provide a special appropriation for the purpose.

Dr. Brown is Past-President of the A.P.H.A. and a long-time member of the Executive Board. He was former Health Officer of Marion County, Ore., and of Mansfield, Ohio. His leadership in the western states has done much to advance understanding between the professions of education and medicine.

#### OCCUPATIONAL DISEASE REPORTS

The U. S. Public Health Service plans to secure state reports on occupational diseases to be published in *Public Health Reports*, according to the Division of Industrial Hygiene, National Institute of Health.

#### INSTITUTES ON PROTECTION OF WAR WORKERS

The California Medical Association Committees on Postgraduate Activities and on Industrial Practice, the Western Association of Industrial Physicians and Surgeons, and the California State Department of Public Health arranged a series of one day institutes on health protection of war workers held August 18—28 in 7 strategic centers in the state. The institutes were planned to interest physicians, nurses, safety engineers, and plant managers called upon to supervise health and give medical care to workers in war industries.

## INDUSTRIAL HYGIENE FOUNDATION

The Industrial Hygiene Foundation, Pittsburgh, Pa., a research and service institution aiming to protect the health of workers in industry, announces the 7th annual meeting of the Foundation at the Mellon Institute in Pittsburgh November 10 and 11. The program will be focused on reducing the loss of man power through the 2½ million days which war workers are losing weekly from illness and non-industrial injuries. This has a direct bearing on the current war production schedule which calls for a plane every 8 minutes and a tank every 12 minutes.

## THE CHARLES V. CHAPIN ANNUAL ORATION

According to the *Journal of the A.M.A.*, the Rhode Island Medical Society has established the annual Charles Value Chapin Oration in honor of the late Dr. Chapin who, throughout his entire career, was active in the field of public health in Rhode Island and Massachusetts. Dr. Timothy Leary, Professor of Pathology Emeritus of Tufts College Medical School, Boston, recently gave the first lecture. Dr. Chapin, who died in 1941, was Superintendent of Health in Providence from 1884 to 1932 and lecturer at the Harvard School of Public Health for many years. He was President of the American Public Health Association in 1927.

## THE ERADICATION OF BRUCELLOSIS

The U. S. Department of Agriculture announced on July 6 that North Carolina is the first state to be officially designated as a modified accredited Bang's disease free area. According to the announcement, North Carolina was also the first state of which all counties were declared free of bovine tuberculosis in 1928.

The modified accredited area now includes a total of 550 counties in 24 states. The eradication work is being

conducted in about 160 additional counties. A county may be officially designated as a modified accredited area when a test for Bang's disease has been applied to all cattle 6 months of age or older, except steers, and the percentage of reactors to the last test does not exceed one per cent of the cattle and the infected herds do not exceed five per cent of the total number.

THE LESLIE DANA MEDAL AWARDED TO  
LEWIS H. CARRIS

The St. Louis, Missouri, Society for the Blind, in coöperation with the National Society for the Prevention of Blindness and the Association for Research in Ophthalmology, arranged a dinner on October 10 in St. Louis in honor of Lewis H. Carris, Director Emeritus of the National Society for the Prevention of Blindness, New York, on the occasion of the award to Mr. Carris of the Leslie Dana Medal for the Prevention of Blindness.

## NURSING IN INDUSTRY

The University of California held a course for nurses in industry July 20 to August 8, conducted by Olive M. Whitlock, R.N., Associate Public Health Nursing Consultant, U. S. Public Health Service. The course was supplemented by demonstrations by industrial nurses and field observation visits.

KANSAS PUBLIC HEALTH ASSOCIATION  
MEETING

The Kansas Public Health Association met September 4, in Emporia, the last of the organization's semi-annual sessions, as it was voted to hold the meetings annually hereafter, in the spring. Newly elected officers include:

*President*—S. N. Mallison, M.D., El Dorado  
*Vice-President*—R. P. Cherry, Wichita  
*Secretary*—Henry H. Asher, M.D., Topeka  
*Secretary and Executive Officer*—F. C. Beelman, M.D., Topeka

#### PUBLIC HEALTH SERVICE CREATES TUBERCULOSIS SECTION

The Surgeon General of the Public Health Service has announced the establishment in the States Relations Division of a Tuberculosis Control Section to co-operate with the Division of Industrial Hygiene, National Institute of Health, Bethesda, Md. Included in the responsibilities of the new section are the examination of U. S. Coast Guard recruits, workers in war industries, persons in war industry communities, and, in co-operation with Selective Service, the Navy and state health departments, to elaborate a system of reporting cases of young men rejected for tuberculosis. A consultation service is available to state health departments in the development of control programs and units for miniature x-rays are being lent to the bureaus of industrial hygiene and tuberculosis control in case finding.

#### NEW YORK CITY OFFERS REFRESHER COURSES IN VENEREAL DISEASES

The New York City Department of Health has announced a series of clinical and refresher courses on syphilis and other venereal diseases which opened on September 23. The department has announced that the purpose of this program is to keep physicians in practice abreast of approved diagnostic methods in syphilis, gonorrhea and other venereal diseases.

#### "PUBLIC HEALTH; RETROSPECT AND PROSPECT"

The New York Academy of Medicine has announced the fall and winter series of a section on historical and cultural medicine to begin on November 4. This meeting will be sponsored jointly by the historical section and by the Committee on Public Health Relations. The first session will include the story of the public and voluntary health agencies in a review of public health in New York City.

#### KENTUCKY CHANGES HEALTH PERSONNEL

Announcement is made of the appointment of Jacob Leland Tanner, M.D., of Henderson as Health Officer of Washington County.

Paul D. Moore, M.D., Albany, now transferred to Casey County, has been succeeded by William R. Kelsay, M.D., of Monticello as Health Officer for Clinton and Cumberland Counties and Wayne County. Dr. Moore succeeds James T. Duncan, M.D., formerly of Columbia, who has gone to Charleston, W. Va.

Donald B. Thurber, M.D., of Carlisle has been appointed Director of the Tri-County Health District, consisting of Trimble, Carroll and Gallatin Counties.

#### KANSAS CREATES DIVISION OF INDUSTRIAL HYGIENE

The Kansas State Board of Health recently announced the creation of a division of industrial hygiene to provide consultant service for industries of the state. This will supersede the Industrial Hygiene Service which for the last five years has been a part of the sanitary engineering division of the State Board of Health. Quarters will be provided for the new unit in Topeka, and will be under the direction of Robert M. Heilman, M.D., of the staff of the U. S. Public Health Service.

#### GRADUATE COURSE IN INDUSTRIAL HEALTH

The Department of Preventive Medicine and Community Health of Long Island College of Medicine at Brooklyn, N. Y., has announced a graduate course in industrial health consisting of lectures and clinics from November 2 to November 13, and industrial internships, November 16 to December 12.

A systematic review of the field of industrial health will be presented by visiting lecturers and the staff of the College of Medicine. Additional in-

formation and a prospectus may be obtained from the College of Medicine, 350 Henry St., Brooklyn, N. Y.

### PERSONALS

#### Central States

FRANK A. BEARDSLEY, M.D., of Frankfort, Ind., has been appointed Health Officer of Clinton County to succeed BRUCE A. WORK, of Frankfort, who is in the Army.

FLOYD L. BURRIS, M.D., is the new Health Officer of Michigan City, Ind., succeeding NORMAN R. CARLSON, M.D., who is with the U. S. Army Air Corps at Hill Field, Ogden, Utah.

ROY H. ELLIOTT, M.D., of Cornersville, Ind., has been appointed Health Officer of Fayette County, to succeed the late JOHN S. LEFFEL, M.D., of Cornersville.

SARKIS H. KASH, M.D., was named Health Commissioner of the Cudahy, Wis., Board of Health at the April 27th meeting of the Board.

ARTHUR LEITER, M.D., of Columbia City, Ind., has been named Health Officer of Whitley County, to succeed OTTO F. C. LEHMBERG, M.D., of Columbia City, who is now a Captain in the U. S. Army.

HOWARD B. METTEL, M.D.,\* of the Indiana State Health Department, where he served as Director of the Maternal and Child Health Program and as Director of the Crippled Children's Program of Indiana, has been appointed as Director of Medical and Health Service of the Midwestern Area, American Red Cross, with headquarters in St. Louis, Mo.

HERMAN G. MORGAN, M.D., on August 12 marked the completion of thirty years as administrative head of the Indianapolis Board of Health. He was guest of honor at a dinner on this occasion.

RUSSELL PERRY REYNOLDS, M.D., has

been appointed Secretary of the Garrett Board of Health, succeeding ROBERT A. NASON, M.D., who has entered government service.

JEANNETTE ROSENSTOCK, R.N.,† has resigned as Nursing Supervisor for Health District No. 51, Utah State Department of Health, Richfield, Utah, to assume the position of Nursing Supervisor for the newly unified Topeka City-Shawnee County Health Services with headquarters at Topeka, Kans.

CECIL A. Z. SHARP, M.D.,† State District Health Officer, Highland, Ill., has been placed in charge of a new health unit in Will County.

HARRY WAIN, M.D., M.S.P.H.,† of Sidney, Ohio, has resigned as Health Commissioner of Shelby County and Sidney, to become Health Commissioner of Troy and Miami County, Ohio.

#### Eastern States

THOMAS D. DUBLIN, M.D., DR.P.H.,† has resigned as Epidemiologist in the Division of Communicable Diseases, New York State Department of Health, Albany, to accept an appointment as head of the Department of Preventive Medicine and Community Health at the Long Island College of Medicine, Brooklyn, N. Y. Dr. Dublin was graduated in medicine from Harvard and in public health from Johns Hopkins School of Hygiene. He has served on the medical staff of the Hospital of Rockefeller Institute for Medical Research, and has been instructor in preventive medicine at both the Johns Hopkins University Medical School and the Albany Medical College. Dr. Dublin is a son of LOUIS I. DUBLIN, PH.D.,\* Vice-President of the Metropolitan Life Insurance Company, New York, N. Y., and Treasurer of the American Public Health Association.

\* Fellow A.P.H.A.

† Member A.P.H.A.

CARL R. FELLERS, PH.D.,\* Research Professor of Horticultural Manufactures at the Massachusetts State College, Amherst, has been called to active duty with the Army in the Chemical Warfare Section.

FRANKLIN M. FOOTE, M.D., DR.P.H.,\* who for 2 years has been District Health Officer in the Kips Bay-Yorkville area of New York City, in co-operation with the Cornell University Medical College, has been called to active duty as a Captain in the Medical Corps of the Army and is stationed at Pine Camp, N. Y.

JOHN E. GORDON, M.D., PH.D.,\* Professor of Preventive Medicine at the Harvard Medical School, Boston, Mass., who for some years has been serving in charge of the Harvard-Red Cross Hospital in England, has been appointed Lieutenant Colonel, U. S. Army Medical Corps and has been assigned to the Division of Preventive Medicine, Office of Chief Surgeon, Headquarters SOS, European Theatre of Operations.

IRA V. HISCOCK, C.P.H., Sc.D.,\* Professor of Public Health, Yale University School of Medicine, Department of Public Health, New Haven, Conn., Lt.-Col., Reserves, U.S.A. Sanitary Corps, was called to active military service and left New Haven, Conn., September 23, 1942.

ERNEST B. HOWARD, M.D., M.P.H.,† formerly of the Division of Genitoinfectious Diseases in the Massachusetts Department of Health, Boston, is now Captain in the Army Medical Corps on Duty as Venereal Disease Control Officer assigned to the Fourth Service Command, Atlanta, Ga.

HARRY E. KLEINSCHMIDT, M.D.,\* New York, N. Y., has resigned as Director of Health Education for the National Tuberculosis Association and has been appointed Director of Medical

and Health Service for the American Red Cross North Atlantic Area, with headquarters in New York, N. Y.

CLIFFORD KUH, M.D., DR.P.H.,† of New Haven, Conn., who has been Chairman of Industrial Health for the Connecticut State Medical Society, has resigned and has been appointed Director of the Bureau of Industrial Health of the California State Department of Health, San Francisco.

DAVID R. LYMAN, M.D., Superintendent of Gaylord Farm Sanatorium, Wallingford, Conn., received the degree of Doctor of Science recently from Wesleyan University, Middletown, Conn.

LEE B. MAILLER, Assemblyman, of Cornwall, N. Y., Chairman of the New York State War Council's health preparedness commission, has been appointed a special consultant in the U. S. Public Health Service.

STANLEY H. OSBORN, M.D., C.P.H.,\* Connecticut State Commissioner of Health, Hartford, received the degree of Doctor of Science at the 86th commencement of Tufts College recently in Boston.

ROBERT W. RIPLEY, M.D., of New York, has been appointed Assistant District Health Officer for Benton and Franklin Counties and the western portion of Walla Walla County, Washington, with headquarters in Pasco.

BENJAMIN SACHS, M.D., M.S.P.H.,† of New York, N. Y., has been appointed Director of the Acadia Parish Health Unit, Louisiana State Department of Health, with headquarters at Crowley, La.

LEON SCHWARTZ, M.D.,† P. A. Surgeon (R), U. S. Public Health Service, recently of Philadelphia, Pa., has been called to active duty and has been placed in charge of the health program for the U. S. Bureau of the Census in its new building at Suitland, Md.

\* Fellow A.P.H.A.

† Member A.P.H.A.

## Southern States

**HAROLD B. GOTAAS**,† formerly Professor of Sanitary Engineering in the School of Public Health, at the University of North Carolina, Chapel Hill, has been commissioned Captain in the Sanitary Corps and is serving as Chief of the Engineering Section of the Division of Health and Sanitation in the Office of the Coördinator of Inter-American Affairs, Washington, D. C.

**HENRY HANSON**, M.D.,\* has been appointed State Health Officer of Florida, effective July 15, succeeding **WILLIAM H. PICKETT**, M.D.,\* of Jacksonville, who has been commissioned in the U. S. Public Health Service. Dr. Hanson formerly served as Health Officer of Florida and recently has been working in South America, chiefly in Ecuador and Peru as technical adviser in bubonic plague eradication and in jungle fever and malaria control.

**CLAIR A. HENDERSON**, M.D., of Savannah, Ga., has resigned as Assistant City-County Health Officer of Savannah and Chatham County, to become Commissioner of Health of Augusta and Richmond County, effective July 1. He succeeds **THOMAS B. PHINIZY**, M.D.,† of Augusta, who recently resigned.

**JOSEPH HIRSH**,† Washington, D. C., has been called to active duty as First Lieutenant in the Sanitary Corps, U. S. Army, and assigned to the Army Technical School at Sioux Falls, S. D., where he is Assistant Medical Inspector, Sanitary Officer and Venereal Disease Control Officer.

**SALLY LUCAS JEAN**,\* formerly Secretary of the World Federation of Education Associations and a consultant in health education, has been appointed Health Education Super-

visor with the Colorado River Relocation Project with headquarters in Poston, Ariz.

**ANNETTE KING**, who has been associated with the West Virginia State Department of Health at Charleston for the past 17 years, has been appointed Acting Director of the Bureau of Public Health Education and Public Relations, succeeding **DOROTHEA CAMPBELL**,† who died September 20 after fifteen years of service as Director of the Bureau.

**PAUL P. MCCAIN**, M.D.,† Superintendent of the North Carolina Sanatorium for the Treatment of Tuberculosis, Sanatorium, S. C., and the Western North Carolina Sanatorium, Black Mountain, S. C., has been named to a similar position at the Eastern North Carolina Sanatorium now under construction in Wilson.

**FRANK L. MCGAHEY**, M.D., formerly of Calhoun City, Miss., has been appointed chief of the Grenada County Health Department.

**ALLAN J. McLAUGHLIN**, M.D.,\* medical director retired, U. S. Public Health Service, Washington, D. C., has recently served in Illinois as consultant to the Committee on Administrative Practice of the A.P.H.A. in connection with the state-wide survey. Dr. McLaughlin's appointment has been announced as medical administrative consultant to the Illinois State Department of Health.

**NELS A. NELSON**, M.D.,\* of Baltimore, Md., Director of the Division of Genitoinfectious Diseases of the Massachusetts Department of Health. Boston, Mass., since 1938. has been appointed Deputy State Health Officer of Maryland. Dr. Nelson formerly served in the Division of Communicable Diseases of the Massachusetts Department of Health. He is an associate in venereal diseases at the Johns Hopkins University School of Hygiene and Public Health, and

\* Fellow A.P.H.A.  
† Member A.P.H.A.

consultant to the U. S. Public Health Service.

GEORGE E. PARKHURST, M.D., of Charleston, S. C., Assistant Surgeon, U. S. Public Health Service, has been assigned as Director of the Venereal Disease Program of the Charleston County Health Department.

P. M. PAYNE, M.D.,† formerly director of the Assumption Parish Health Unit, Napoleonville, La., has been transferred to the Evangeline Parish Health Unit at Ville Platte, La., as Director.

WILLIAM H. PICKETT, M.D.,\* formerly State Health Officer in Jacksonville, Fla., has been commissioned in the Reserve of the U. S. Public Health Service and has been assigned to duty as Director of Health for Kansas City, Kans., effective August 1.

GEORGE E. RILEY, M.D., Health Officer of Clay County, West Point, Miss., has been appointed Director of Hinds County Health Department, Jackson.

CURTIS M. ROBERTS, M.D., of New Albany, Miss., has resigned as Health Officer in Prentiss County, to accept a similar position in Clay County, with headquarters in West Point.

#### Western States

J. J. BLOOMFIELD\* recently gave five lectures in connection with the University of California's Industrial Training Series, using as his topics Industrial Hygiene Problems in the United States; Effect of the War; National, State, and Local Industrial Hygiene Services; and Health Education.

FRED T. FOARD, M.D.,\* Surgeon, U. S. Public Health Service, San Francisco, Calif., has been assigned as Regional Medical Officer for the Ninth Civilian Defense Region, with headquarters in San Francisco.

ABRAHAM L. GELPERIN, M.D.,† of Baltimore, Md., has been appointed Venereal Disease Control Officer of Richmond, Va., succeeding AARON WILSON BROWN, M.D., of Pocatonton, who recently resigned to enter private practice.

ELBERT GOOLSBY, M.D., was recently appointed Health Officer of Paris, Tex.

WILLIAM GROSSMAN, M.D.,\* of Richmond, Va., has accepted a commission in the U. S. Army, resigning his position as Director of the Bureau of Communicable Diseases in the Virginia State Health Department.

IRVING D. JOHNSON, M.D., C.P.H.,† of Marysville, Calif., has resigned as Health Officer of the Sutter-Yuba Bi-County Public Health Unit in order to organize a new department in Marin County, at San Rafael.

EUGENE L. KIDD, M.D.,† of Centralia, Wash., formerly Health Officer of Lewis County, has been placed in charge of the unit in Snohomish County with headquarters in Everett.

DR. RAYMOND DE VAN KIMBROUGH, of Norfolk, Va., was appointed on June 1 as State Venereal Disease Control Officer for the Tidewater Area, Va.

ROSCOE C. MAIN, M.D.,\* of Santa Barbara, Calif., has resigned as Health Officer of Santa Barbara County, after 13 years of service, to become senior physician in the communicable disease section of the Los Angeles County Health Department.

GRUNDY E. McDONALD, M.D.,\* resigned as Health Officer of Long Beach, Calif., on August 15, and has been succeeded by his assistant, FRANK W. STEWART, M.D.†

F. A. MUSACCHIO, M.D., M.P.H.,† formerly Director of the Acadia Parish Health Unit, Crowley, La., was recently appointed Director of the St. Mary Parish Health Center,

\* Fellow A.P.H.A.

† Member A.P.H.A.



Franklin, La., to succeed Dr. G. VASQUEZ, who is on military leave.

JAMES A. OUTLAND, M.D., of Murray, Ky., Health Officer of Calloway, will take over the work in Trigg County.

This is a result of the resignation of LEONARD A. CROSBY, M.D., of Eddyville, Ky., who has been in charge of Caldwell, Lyon, and Trigg Counties.

W. W. PETER, M.D., DR.P.H.,\* formerly Medical Director, Navajo Area, U. S. Indian Service, Window Rock, Ariz., has accepted a war service appointment as Associate Professor of Public Health in the Department of Public Health, Yale University School of Medicine, New Haven, Conn.

FRED W. SUTTON, M.D., has been placed in charge of the Health Department of Beaumont, Tex., succeeding CHARLES HUGH TODD, JR., of Beaumont, resigned.

PAUL L. WERMER, M.D.,† formerly Director of the Upshur County Health Unit, has been transferred to take

charge as Director of the Waco-McLennan County Health Unit, Waco, Tex.

### Foreign

EDUARDO ESCUDERO, M.D., of Santiago, Chile, has been appointed as Minister of Public Health and Social Welfare of Chile, it has been announced.

PABLO MORALES OTERO, M.D.,† has been appointed Director of the School of Tropical Medicine, University of Puerto Rico, San Juan, by Columbia University, with which the School of Tropical Medicine is affiliated. Dr. Morales has been Acting Director of the School for some months. He succeeds GEORGE BACHMAN, PH.D., who is now in China representing the American Board for Medical Aid to China in Chungking.

DR. CAESAR GORDILLO ZULETA, of Lima, Peru, has been appointed as General Director of Public Health, it has been announced.

## CONFERENCES AND DATES

American Academy of Pediatrics. Chicago, Ill. November 4-7.

American Association for the Advancement of Science. New York, N. Y. December 28-January 2.

American Association of State Highway Officials. St. Louis, Mo. December 7-9.

American Chemical Society—National Chemical Exposition, National Industrial Chemical Conference. Sherman Hotel, Chicago, Ill. November 24-29.

American College of Surgeons—1942 Clinical Congress. Cleveland Municipal Auditorium. Cleveland, Ohio. November 17-20.

American Education Week—Sponsored jointly by the National Education Association, American Legion, U. S. Office of Education, and the National Congress of Parents and Teachers. November 8-14.

American Library Association—Midwinter Conference. Chicago, Ill. December 28-31.

American Public Welfare Association. Baltimore, Md. December 11-13 (tentative).

American Society for Public Administration. Chicago, Ill. December 27-28.

American Standards Association. New York, N. Y. December 10.

American Statistical Association. Cleveland, Ohio. December.

American Water Works Association—

North Carolina Section—Washington Duke Hotel, Durham, N. C. November 2-4.

Virginia Section—Jefferson Hotel, Richmond, Va. November 5-6.

West Virginia Section—Chancellor Hotel, Parkersburg, W. Va. November 12-13.

Florida Section—Miami, Fla. November 12-14.

Association of Military Surgeons of the United States. San Antonio, Texas. November 5-7.

Engineers' Society of Western Pennsylvania—Third Annual Water Conference. William Penn Hotel, Pittsburgh, Pa. November 9-10.

- Florida Public Health Association. Miami, Fla. December 7-9.
- Industrial Hygiene Foundation—7th Annual Meeting. Mellon Institute, Pittsburgh, Pa. November 10-11.
- Michigan Public Health Association. Grand Rapids, Mich. November 11-13.
- National Association of Housing Officials—Region IV. Savannah, Ga. November 19-21.
- National Association of Housing Officials—Region II. December 3-5. New York, N. Y.
- National Committee for Mental Hygiene—33rd Annual Meeting. Hotel Roosevelt, New York, N. Y. November 12.
- National Foundation for Infantile Paralysis—3rd Annual Medical Meeting. New York, N. Y. December 3-4.
- New York State Association of Public Health Laboratories—Mid-year Meeting. State Laboratory, Albany, N. Y. November 6.
- New York State Conference on Social Work. Syracuse, N. Y. November 10-13.
- Southern Branch, A.P.H.A. Richmond, Va. November 10-12.
- Southern Medical Association—36th Annual Meeting. Richmond, Va. November 10-12.

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# American Journal of Public Health

## and THE NATION'S HEALTH

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### Public Health and Civil Defense in Great Britain During the War\*

W. M. FRAZER, O.B.E., M.D., M.Sc.

*Medical Officer of Health, City and Port of Liverpool; Professor of Hygiene,  
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THE point of view which I shall express in this communication is that of the medical officer of health of a large English city and port through which many of your nationals have passed when visiting Great Britain and Europe in peace time, and through which Americans are still passing for other and grimmer purposes. It was laid down by the Ministry of Health and the Ministry of Home Security early in 1939 when our air raid precautions schemes were commencing to take shape, that the medical officer of health should be responsible for such civil defense services as emergency ambulances, first aid posts, first aid parties (stretcher bearers), mortuaries, and the emergency extensions of the local authority's hospitals. He is, in fact, in charge of the casualty services, being responsible for the care of the injured, and the disposal of the dead, and, in addition, is associated with a number of other services

which have been established to deal with various difficulties arising both from the effects of air raids and from the upset to the life of our crowded urban populations due to movements of the population in furtherance of the war effort. Thus, medical arrangements are required in connection with the larger public shelters, with rest centers, evacuation schemes for school children, expectant mothers and blind persons, and to supervise day and residential nurseries for the children of mothers engaged in the war factories which have been established in all industrial parts of the country. All these arrangements for dealing both with actual casualties from air raids and with the multifarious difficulties of the civilian population under war conditions were made under general instructions issued by the Ministry of Health and Ministry of Home Security and followed a pattern which was therefore common to the whole of Great Britain, such slight differences as existed being due to local circumstances. Our arrangements in Liverpool in air raids were accordingly similar to those

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of other urban areas which were heavily bombed during the period from August, 1940, to May, 1941; and my observations on the subject in this paper, although arising from experience in Liverpool, apply to a considerable extent to other parts of the country.

Let us consider the situation as it was in any urban area in Great Britain likely to be subjected to heavy bombing, in early August, 1940, just before the onset of air raiding. Take first of all that indefinable quality of the communal spirit termed morale. That it was high was not, I think, due to ignorance of the terrible effects of heavy bombing, because morale remained satisfactory even after months of attack had caused severe damage to many industrial areas and had taken heavy toll of human life. The courage of our population in such circumstances had its origin in a complex of factors among which are clearly discernible a profound conviction of the justice of the cause in which we were engaged and a feeling of confidence in the government, and especially in the Prime Minister, Mr. Churchill, whose speeches at that time, sometimes given over the wireless, were a source of great inspiration to the average man and woman called upon to face the imminent horrors of air bombardment. But we had other sources of consolation—the support of the Dominions, the friendship and material help of the United States, and the feeling of comradeship which rapidly strengthened between all classes in the community called upon to face together a common peril. At that time—early in August, 1940, before air raids had commenced in earnest—our civil defense services were in an advanced state of preparation but were by no means complete, and large numbers of people were voluntarily serving as wardens, ambulance drivers, stretcher bearers, fire-watchers, telephonists, and the like. The fact that unlimited opportunities

for service were available was a fortunate circumstance and it had a profoundly favorable influence upon civilian morale. I hope I may be allowed to speak from personal experience when I say that there is nothing which sustains one's courage and fortitude during an air raid so much as doing a job and forgetting about the air raid.

Another favorable circumstance was the fact that we in Great Britain had been led to expect that air raids were going to be made in overwhelming force at the outset of the war, and provision was actually made for dealing with many thousands of casualties in the large centers of population. You may judge of our surprise in Liverpool, for example, when the first raids happened and we found that casualties were counted, not in thousands or hundreds, but only in scores. It almost looked as if the size of the Luftwaffe was a product of the German propaganda machine rather than of their factories. But that comparatively happy situation did not continue after the first few months, and later we experienced very severe raiding with large casualty lists; and when that began to happen our civil defense personnel had been thoroughly trained in the hard school of war, shelters had been rapidly increased in number, and the arrangements for caring for the many homeless people after a night's air raid had reached a satisfactory degree of efficiency.

Another circumstance favorably affecting the health and morale of the community was the excellence of the food supply. Prior to the outbreak of war the Government had set up a branch of the Board of Trade under Sir Henry French to consider the question of the nation's food in the event of war, and to work out the complicated and detailed administrative arrangements for the early rationing of certain of the principal foodstuffs such as meat, fats,

and sugar in the event of hostilities occurring. This branch was expanded and took shape as the Ministry of Food in 1939 on the outbreak of war, and almost immediately rationing of meat, sugar, fats, and tea was introduced. At first rationing was limited to these articles of food, and the scale was a generous one, but as time went on other foodstuffs were rationed, and today all important foodstuffs are dealt with under the rationing system except bread, potatoes, and vegetables, of which unlimited amounts can be obtained. In spite of moderately severe rationing it can be said with confidence that the population of Great Britain is today in all respects adequately nourished, and this expression of opinion applies to children as well as to adults. Children are, in fact, well looked after from the dietetic point of view, having a larger milk ration than the adult, while babies under the age of 3 years receive fruit juice concentrates, such as black-current puree and rose-hip juice, as well as the additional milk ration. Vitamin C deficiency has only exceptionally occurred among the infant population of Great Britain during this war, although in 1914-1918 it was relatively common.

The activities of the Ministry of Food are not, however, restricted to the importation of food and the imposition on the population of a rationing system. This department, under the leadership of Lord Woolton and guided by the advice of Professor Drummond and Lord Horder, has shown great wisdom in arranging for cheap and nutritive meals to be available for all workers at canteens for which food is provided apart from the ration. Mobile canteens, some of which have been sent through the generosity of voluntary societies in the United States, supply food to workers in isolated places and to civil defense personnel during long air raids. A system of National Kitchens has also been developed under the auspices of

local authorities, where meals can be obtained by any persons requiring them, again without the surrender of ration coupons. The principle underlying these arrangements is that the supply of food cooked in large quantities at communal kitchens is an economy because both fuel and time are saved and variety is more readily obtained, while some of the hardships imposed on very small families by the rationing system are mitigated. Another provision made by the Ministry of Food, which has had favorable results from the public health point of view, has been the introduction of a national wheat flour of 85 per cent extraction to replace the white flour previously almost universally in use in Great Britain. This flour, from which appetizing bread and moderately satisfactory cakes are made, contains nearly three times as much of the main items of the vitamin B complex, nearly three times the amount of iron and more than twice the weight of mineral salts as are contained in white (73 per cent extraction) flour.

Looking back on the Ministry of Food's policy during the last three years, the judgment may be fairly expressed that the population of Great Britain has been kept in a state of adequate nutrition, and health and working capacity have been well maintained, even if luxuries have, perforce, had to be abandoned. There has been a levelling of food consumption since, except for the black market which has never attained large dimensions, both rich and poor enjoy practically the same diet. It is true, of course, that the rich are poorer because of heavy taxation and the poor richer because unemployment has disappeared and wages are relatively high; and the final result of this economic change, under the rationing system, is that every class in the population is being fairly treated from the rationing point of view, so that there is widespread satisfaction with the

way the Ministry of Food has performed its task.

Especially noteworthy has been the coöperation existing between the Ministry of Food charged with the duty of distribution, and the Ministry of Agriculture whose duty it is to encourage the production of food. Under the guidance of the latter Ministry, farmers have brought under cultivation many millions of additional acres of land, milk production has increased, and the people, both in the towns and in the country, are using all the available space in their gardens in order to grow potatoes and vegetables. Great Britain during the past two or three years has become a nation of gardeners. All are helping, all are interested, and there is keen competition between neighbors to produce the finest peas, potatoes, lettuce, and tomatoes. The net result of all these activities is that Great Britain, for the first time in her recent history, is producing at home about two-thirds of the food she consumes; much shipping space is thereby saved and an adequate supply of the protective foods is insured, to the great advantage of the health of the community.

In order to keep in touch with the situation in regard to nutrition in the country, the Ministry of Health has initiated surveys which are being assisted by two expert medical officers supplied by the International Health Division of the Rockefeller Foundation.

The next factor influencing the public health in Great Britain during the present war is that of movements of population proceeding in ever increasing measure during the past three years. These movements, defensive in character as regards the evacuation of children from crowded urban districts to small towns and rural areas, but offensive and directly related to the war effort in the call-up of man power and woman power to the services and to factories, have now assumed large pro-

portions; and have, of course, created many sociological, ethical, and epidemiological problems. It is with the latter that we are mainly concerned. That population has altered to a considerable extent is shown by the experience of one large urban area—perhaps not an entirely typical one—where today the number of civilians is only two-thirds of the corresponding figure three years ago. Apart from the regular services—the Army, Navy, and Air Force for men and the A.T.S., W.A.A.F. and W.R.N.S. for women—such activities as factory work, labor at the docks, the National Fire Service, the Women's Voluntary Service, and the Civil Defence Service have all caused internal movements of the population and, except in the case of the armed forces, the trend has on the whole been toward, rather than away from, the larger cities.

The epidemiologist, bearing in mind the historic consequences of movements of population under adverse sanitary conditions and in a different age, tended, before 1939, to view the population changes, inevitable in wartime, with some apprehension. And, indeed, in one or two respects, his pessimism has been justified as far as Great Britain is concerned since experience has shown that three diseases, two major and the other minor, have largely increased as a result of the war, although, speaking generally, the epidemiological situation has been satisfactory.

One of the major conditions referred to is venereal disease which is spreading with some rapidity in Great Britain, especially, of course, in the port areas and industrial towns. In Liverpool the incidence of cases of syphilis attending for treatment at the venereal diseases clinic is about four times what it was before the war, and twice in the case of gonorrhea. Other large ports return a similar increase. In spite of the widespread provision of treatment facili-

ties in all areas, venereal diseases are taking a severe toll in terms of human health and happiness, marital infection being an almost unavoidable consequence. This evil of the spread of venereal disease during the war is well known throughout the country and is being urgently discussed in official circles and in various voluntary societies which are interested in the social condition of the people; but, as we are all aware, the problem of prevention of a disease arising from sexual relations presents features which go far beyond the domain of public health and epidemiology. Because questions of ethics, religion, and law are involved, the subject of the prevention of venereal diseases has seldom, at least in Great Britain, been examined in the impartial and scientific way in which the hygienist would discuss, for example, the subject of immunization against diphtheria, and as a consequence while progress in treatment has been outstanding, progress in regard to prevention, even on the propaganda side, has been very slight.

It is recognized, of course, that, next to the avoidance of risk altogether, early treatment, by rendering the patient non-infectious within a period of days in the case of gonorrhea and weeks in the case of syphilis, is the best method of prevention available. But in Great Britain, at least at present, the attempt at solving this serious public health problem ceases with the provision of full treatment facilities for both sexes, and other methods, although now being considered, have not been tried. One body of medical opinion thinks that notification together with compulsory treatment of one or both sexes is well worth a trial, but it is recognized that the administration of such a system presents formidable legal difficulties, and the adoption of compulsion in regard to treatment would constitute a great departure from our national tradition. Nevertheless, other

countries such as Sweden possess compulsory powers and it is not inconceivable that Great Britain, under the stress of war, may be driven to take some action in the same direction. Certainly the present situation is not a very satisfactory one for the health officer.

On a few occasions I have received, through the English Ministry of Health, letters from American cities complaining that one of their nationals has returned home after infection from a named woman in Liverpool and asking that some action should be taken. From this I assumed that there are powers for compulsory treatment in some of your states and I know now that that is the case. But in Great Britain a medical officer of health is quite powerless to take compulsory action of any kind and he is always in danger of an action for libel or slander—concerning which the law in England is much more inconvenient than it is in your country where, I understand, freedom of speech really means what it says.

The minor disease, the spread of which is ascribable to movements of the population, is scabies. Prior to the war scabies was of slight consequence, very few cases being reported even among school children; but during the past two years the number of cases of this trivial and easily cured skin condition has increased to an enormous extent. The researches of Kenneth Mellanby show that scabies spreads from one person to another as a result of fairly close contact, and he is of opinion that the commonly accepted view of frequent infection through the medium of blankets is erroneous. In Liverpool we have opened about eighteen treatment centers for dealing with this condition and many thousands of cases are being dealt with. Nevertheless, scabies is now, in spite of our efforts, widespread throughout the community and it seems unlikely that it will be stamped out until after the war.

The other salient features of the epidemic situation since the outbreak of hostilities are the occurrence of a small number of outbreaks of paratyphoid B, not, it is thought, due to the war; and the second major disease a significant increase in the pulmonary tuberculosis notification rate in respect of age groups from 15-25 and 25-35 in the case of females, and 45-55, 35-45 and 25-35 in the case of males. In the opinion of those who have analyzed the figure of occupational mortality and morbidity, these increases in the incidence of pulmonary tuberculosis are due, not to food deprivation, but to overwork and overstrain directly occasioned by the war effort.

Regarding other major infectious diseases there is happily little to be said. Before the war there was no indigenous typhus, malaria, or smallpox in Great Britain so that, for outbreaks of these diseases to occur, importation of the infecting agent would have to take place. It is, of course, well known that typhus is now widely spread throughout Europe, not only in the East and South East where it has for years been endemic, but also in the West. Precautions have accordingly been taken at the British ports and a vigilant scrutiny of persons entering the country who have come from countries infected with typhus is being undertaken. On one or two occasions a case of smallpox has been admitted into the country and there has been one small outbreak of this disease, arising not from the original case but from a contact. There is so far no malaria imported from outside.

We are, therefore, fortunate in having escaped in three years of war any epidemics of the major infectious diseases and we are hoping, perhaps with some justification for our precautions have been carefully taken, to prevent the importation of typhus, malaria, and smallpox from the neighboring and unhappy continent of Europe. If we suc-

ceed in this effort it will be partly due to forethought and perhaps a little to luck, which no epidemiologist can afford to despise.

The direct danger of epidemics resulting from air raids was thought before the war to be likely only in connection with fractured water mains which might become heavily contaminated with sewage and thus cause an outbreak of typhoid. It may be said at once that this danger, although apprehended on apparently adequate grounds, has never materialized, and it has been reported by the Minister of Health recently that not one typhoid death in Great Britain during the period of heavy bombing has been due to pollution by water-borne infection. As far as Liverpool is concerned, it is certain that no case of typhoid occurred which could be traced to infection of the water supplies as a result of fractured mains. There are probably two factors which have led to this remarkable freedom from typhoid fever in spite of continuous bombing of crowded areas—a feature of our health record which has amazed American medical visitors to Great Britain. The first of these factors is the scarcity of typhoid fever in the urban areas in most years, although an epidemic of perhaps a few hundred cases may infrequently occur. In an average year the City of Liverpool, for example, will show a return of less than a dozen sporadic cases of typhoid and many years have elapsed since an epidemic of this disease last occurred. Most of the larger cities can tell a similar tale and, as a consequence, typhoid carriers are very scarce in the areas most subjected to bombing, and sewage which may have contaminated some of the water mains is unlikely to be infected. In the second place, arrangements are available in all large areas for heavily chlorinating the water in repaired mains before putting them into service again and, although this



system was not used universally during the heavy bombing raids, it was sufficiently employed to serve as a valuable safeguard. As far as London was concerned, the Metropolitan Water Board has, from the start, used mobile chlorinators with liquid chlorine for the larger mains (*i.e.*, more than 12 ins. in diameter), and bleach for the smaller mains; the amount of the chemical being calculated to give 10 parts per million in the repaired main. Because of the experience in Great Britain that the risks of outbreaks of typhoid are slight, immunization against this disease has not as a rule been regarded as necessary, but vaccines are available and would be used for mass inoculations if this was thought desirable.

I have been discussing conditions affecting generally the state of the public health in Great Britain during the three years commencing September, 1939, when war with Germany was declared. I propose now to consider in rather more detail the purely civil defense side of my subject with a view to discussing what effects the elaborate arrangements made to safeguard our population against the dangers of air raids had in protecting life and limb, health and morale during the period from August, 1940, *i.e.*, when raiding began, to May, 1941, when, as if by a miracle, this form of attack suddenly ceased. It may be that for the sake of clarity it will be necessary to repeat occasional items of information given in the preceding pages and if this happens my excuse—with infinitely less cause—must be that of Lord Bryce, at one time our British Ambassador to your country, who in his monumental work on the American Commonwealth expressed the opinion that if an author is obliged to choose between repetition and obscurity there should be no doubt as to the nature of his choice.

In order to be in a position to consider the subject from a practical point

of view, let us discuss in detail what actually happens during a severe air raid on a British city. Suppose that the raid is of such dimensions that it entails a casualty list of 1,000 killed and 2,000 severely or slightly injured. A raid of this kind may be regarded as severe relative to the scale of raiding between August, 1940, and May, 1941, although not comparable to what has already happened on many occasions to German towns during the present year.

On the air raid alarm being sounded, all staff on stand-by duty either at their homes or at depots report and make ready for eventualities. Less than half-an-hour after the alarm all control centers and ambulances, first aid party and rescue party depots should be fully manned. The chief officers of the main services, *e.g.*, casualty services, rescue services, fire and water services, police, etc., with the control officers, are on duty at the city's main report and control center, while the divisional report and control centers and depots, on which the first impact of the raid will fall, are making the final preparations for immediate action.

Then sometimes there is a wait of several minutes before the first report of an "incident" will be received at a divisional control center from a warden by telephone. The air raid has begun. I have used the term "incident" and this requires explanation. An incident—surely a masterpiece of understatement—is any occurrence during an air raid which leads or may lead to injury to persons or damage to property, such as the explosion of a heavy bomb on a block of buildings, the fall of an incendiary bomb on a house, the dropping of a time bomb in a field near some buildings, destruction by blast of windows or doors, and even the fall of an unexploded anti-aircraft shell or shell splinters, if injury or damage is occasioned.

All these events—large or small—are

incidents and are reported to divisional control by the wardens as soon as possible. Wardens have a special report form and have been trained to report by telephone according to the headings on the form. Thus an attempt is made to give a complete picture of the incident—the approximate number of casualties, an idea of the damage resulting, whether a road has been blocked, or water or gas mains opened up, electric cables, telephone or tramway wires broken, etc. This telephoned report is entered on a form at divisional headquarters and it forms the basis for any immediate action taken, further reports on the same incident being telephoned from time to time as events develop. A usual event requiring a supplementary report is the occurrence of a fire which may break out or be discovered after the preliminary report has been dispatched.

In actual experience, under the hazardous conditions obtaining at the scene of an incident, wardens' reports are by no means accurate and this inevitably leads to unsuitable action being taken at the divisional report and control center which may send too many or too few services, or may perhaps fail to send a service which is urgently required. As a remedy for this difficulty the practice has grown up of sending to the location of the incident an "immediate action party" consisting of one ambulance, a car containing a first aid party of two persons, and a small rescue party with its own vehicle. This party is under the charge of an experienced man whose duty it is to assess the dimensions of the incident and report to the divisional control center what further services are required; the parties meanwhile dealing with the most urgent casualties.

If the incident is a large one with much damage and many casualties, such as occur when a large building is destroyed or a public air raid shelter or hospital severely damaged, it is cus-

tomary to establish an "incident post" in a convenient situation near to the scene of the disaster and to place the local control in the hands of an incident officer who is usually a police inspector and to whom the leaders of all services report for general directions. The main duties of the incident officer are to coördinate the various services, to report from time to time to divisional control as to the progress made in dealing with casualties and damage, to give directions for the regulation of traffic at or near to the site of the incident, and to return to their depots as soon as possible redundant services. This last named duty is important, as there is a marked tendency on the part of the divisional control centers and also the main control centers to send to the scene of a serious incident of the kind I am discussing more ambulances, first aid parties, and rescue parties than can usefully be employed at any given time on the site of the disaster. Such action on the part of various chief officers at main headquarters in the face of a disaster to a hospital or a large public air raid shelter is only natural, as reports are often imperfect or misleading and tend to exaggerate the magnitude of the occurrence, but the temptation to play for safety and send an unduly large proportion of ambulances and parties to a major incident should be sternly resisted during a severe air raid, as these services may be urgently required elsewhere.

If I may be permitted a personal confession—I remember at least three occasions when I was guilty of this error of judgment during the raids over Liverpool between August, 1940, and May, 1941. These occasions were in connection with the demolition of a hospital, the firing of a train loaded with ammunition and the destruction of a large public shelter. Each of these incidents caused much loss of life and, in the case of the train, widespread de-

struction; but to me, the saddest occurrence of all during more than 100 air raids was the demolition of a large municipal hospital and the loss of much esteemed medical and nursing staff, including two medical students. On that occasion we sent during the night many ambulances and first aid and rescue parties, some of which were quite properly returned to the depots by the incident officers. The hospital staff rightly took the ambulances and parties as a matter of course; but what was highly appreciated was the dispatch of a mobile canteen on a Chevrolet chassis, one of several presented to the city through the generosity of certain voluntary societies in the United States. Indeed, according to the testimony of several junior members of the nursing staff of the hospital, this mobile canteen saved more lives than the ambulances.

Action at the scene of an incident is not, of course, confined to the night of the actual air raid. Many persons, trapped in debris, but protected in basements or under arches formed by beams and girders, are rescued the following day and a few are found alive two or three days after the raid. A proportion of them die from shock or exposure shortly after extrication from the debris.

Many bodies are recovered days or weeks after the raid and add to the figures of casualties, which cannot, therefore, be accurately compiled until a considerable time has elapsed after the night of the raid. Day after day the rescue parties tunnel under the debris, often in highly dangerous circumstances, until all persons known to be in the building have been accounted for. The compilation of the list of persons buried under the debris is usually the duty of the incident officers, and it is not the least responsible of his duties, since omissions from it may lead to losses in lives through the premature abandonment of the search in the debris, while the inclusion of the names

of persons who were away or safe in shelters wastes the time of the hard pressed rescue parties. It has been a rule in Liverpool that the search in the debris of a demolished building shall not be given up until the incident officer is satisfied that all persons who might be alive have been rescued.

If the raid is a large one, as we are assuming, incidents small and great are occurring in many parts of the area and in adjacent areas, because enemy bombs are no respecters of local government boundaries; and ambulance and first aid and rescue staffs are busily engaged throughout the night in their dangerous but humanitarian occupations. The fire services—taken out by the Central Government from the local authorities months ago—are certain to be heavily engaged, since many and extensive fires are the invariable accompaniment to any air raid. Damage from fires is, in the aggregate, greater than direct damage from bomb explosions and it can only be minimized by highly efficient fire services, the system including elaborate arrangements for fire-watching, in which a large part of the adult population, male and female, is compulsorily engaged. Fires tend to create panic, do extensive damage not of course confined to the original site, and cause not a few casualties. The British experience in 1940 and 1941 was that in large raids the fire services were insufficient in many areas so that some fires had to be neglected until too late, owing either to the lack of personnel and equipment or to the absence of adequate water supplies. We have now a well equipped National Fire Service, elaborate fire-watching arrangements, and emergency supplies of water stored in metal, brick, or concrete tanks in all vulnerable areas.

The Medical Officer of Health's services are not, however, concerned with fires, but only with casualties arising from any cause, and his main duty is to convey injured persons away from the

scene of the incident as expeditiously as possible to hospitals and first aid posts. In Liverpool it is an instruction to first aid party leaders that a minimum of first aid should be given and that it is in the patient's interest that he should receive skilled medical and nursing attention at the earliest possible moment. Elaborate first aid procedures are therefore avoided, little splinting is done, sandbags along the side of an injured limb being often all that is necessary; but tourniquets are, of course, used to check serious arterial hemorrhage.

The amount of first aid required will depend upon the distance the patient has to be carried to hospital. In Liverpool and other large cities distances are short and accordingly little first aid is given; in rural areas, with long distances to the nearest hospital, more first aid would be necessary.

In Great Britain there has been an extensive call-up of doctors for the services and it is seldom that medical practitioners can be spared to deal with casualties except at large incidents. However, we have a small number of mobile surgical units equipped with instruments, drugs, and dressings and when called out these are accompanied by a doctor and two or more nurses. As far as possible mobile units are only sent to incidents where there are many serious casualties and the doctor and nurses, assisted by first aid men, may then undertake some rough surgery, give injections of morphia, and check serious hemorrhage. There have been occasions when the doctor sent out with a mobile unit has amputated a badly injured limb of a person trapped in wreckage, but the conditions calling for such heroic surgery are fortunately seldom present and the results, as might be expected, are generally unhappy.

One extremely useful function performed by the medical man in charge of a mobile unit is the giving of morphia to injured persons suffering from seri-

ous pain. The proportion of such cases is not, surprisingly enough, very large, and shock and hemorrhage remain our greatest problems.

So far I have been discussing action at the site of a bomb explosion or other air raid incident, and I propose now to shift the scene to the city's Central Air Raid Precautions Headquarters, usually referred to as the Main Report and Control Center. Here during an air raid are stationed the heads of the various services, such as the Chief Constable, the City Engineer, and the Medical Officer of Health. Each of these officers is assisted by a small staff and he is represented at all the divisional report and control centers. During the air raid, "situation reports" in connection with every incident are transmitted by the divisional operations centers to main headquarters and thus a fairly clear picture of the course the raid is taking throughout the city is presented. It may become evident that one or two parts of the area are bearing the main brunt of the attack and this will lead the heads of services to reinforce from other divisions the division or divisions subjected to heavy attack. From time to time requests will be received from adjacent local authority areas for the loan of ambulances or parties, and as far as possible applications of this kind are met at once by large cities with abundant services under arrangements for mutual aid which have been made under the general directions of the regional commissioner. Groups of local authorities have been formed in all areas and mutual support is controlled by a special officer—the Group Officer for Mutual Support—through whom applications for reinforcements within the group or from one group to another are received. If reinforcements are required to proceed from one region to another arrangements are made through the regional commissioners. In Liverpool, however, this was seldom required.

in connection with the ambulance, first aid, and rescue party services, but the need for reinforcement from group to group and region to region was often experienced in the case of the fire services and was one of the main reasons for the nationalization of this branch of the organization.

As far as the casualty services were concerned, the Medical Officer of Health or his deputies at Main Control during an air raid deal direct with first aid posts and hospitals—not through the divisional organization as they do in the case of ambulances and first aid parties. Early in the raid hospitals and first aid posts taking cases from the parts of the city which appear to be the main objects of attack are warned by telephone that they must shortly expect a large influx of casualties. We receive a daily return of the number of beds available for casualties at the various hospitals in the city and are therefore in a position to estimate, during the raid, the moment when particular hospitals are becoming overloaded and the ambulance depots should be instructed to switch casualties over to other hospitals. Sometimes a hospital or first aid post is damaged and can take no further casualties. One way in which a hospital may be put out of action without extensive damage occurring is when main water pipes or sewers are broken or when a time bomb falls near the main entrance; but fortunately, pipes and sewers can be replaced within forty-eight hours and time bombs rapidly rendered harmless. There have been occasions when, in the middle of the night, hospitals have had to be partly or completely evacuated because of the fall of a delayed action bomb near to some of the wards. The removal of seriously ill or injured patients in large numbers from one hospital to another during an air raid at night is a responsible undertaking, and to facilitate such removals we have converted a large number of single-decker

buses into ambulances, each capable of taking ten stretchers.

During an air raid of the kind we are considering, the emergency mortuary facilities will be fully employed. In Great Britain the standard of mortuary accommodation for target areas, as laid down by the Ministry of Health, is 3 places per 1,000 of the population. Mortuaries have been organized in some of the older schools and each possesses office facilities, viewing rooms, and a large space with racks for the accommodation of the dead. There is a Chief Mortuary Officer for the city and each mortuary has a superintendent, a clerical staff, and attendants. Needless to say, this kind of work is highly unpopular and it has been found difficult to recruit the necessary staff even if high wages are paid. I have been helped in connection with the staffing of this service by the clerical staff of the Corporation's departments, porters from hospitals, and medical students from the University who, naturally enough, have less objection to handling dead bodies than the average citizen.

During the raid and on the days following it the atmosphere at the emergency mortuaries is one of grim and unrelieved tragedy. Apart from the actual handling of bodies the greatest difficulty in connection with the mortuary service is that of identification. Some bodies are so injured that they cannot be identified with certainty, except by such indirect methods as the recognition by relatives of clothing or possessions. In some cases, of course, even that is not possible. In order to avoid the necessity of relatives viewing many bodies, the practice is followed of placing all articles found in the pockets of the deceased into a container marked with the same serial number as the body and, as a further help toward identification, strips of the outer clothing are taken and placed in the container. If there are letters, a national registra-

tion card, or an identity disc on the body at the time of death, and these are still available, the recognition of the deceased by relatives is rendered easy; but in many cases bodies cannot be identified at all and are buried in a common grave at a mass burial service. Questions in regard to presumption of death sometimes arise in relation to the disposal of property or to re-marriage and therefore from the legal point of view the mortuary records are of great importance. These records in Liverpool consist of a mortuary register, containing information in regard to serial number, date of reception of body, name of person (if known or ascertainable), age (if obtainable), sex, home address, cause of death (*i.e.*, falling masonry, bomb explosion, etc.), incident from which body was recovered, reference number of notification to friends or relatives, type of funeral arranged, date of burial, cemetery, section and grave number in which interment took place and signature of undertaker removing the body; property register containing an inventory of clothing and effects taken from the body; and various forms, including burial certificates, and in relation to funerals. Identified bodies can be claimed by relatives and buried privately—a grant being made by the Government toward the expense of burial in certain cases. In a proportion of cases relatives prefer the method of mass burial, and identified and unidentified bodies, each in a wooden coffin, are interred in vaults at our main cemetery, all religious denominations taking part in the communal ceremony.

The next line of action during an air raid is to transport persons rendered permanently or temporarily homeless by demolition of or damage to their houses to rest centers which have been established in convenient situations in all areas liable to bombing. Rest centers—a strictly temporary provision—are in Liverpool and other areas under the

administration of the Public Assistance Officer and have been established in schools, church halls, dance halls, large houses, etc. They are provided with elementary cooking facilities, mattresses, blankets, chairs and tables, cutlery and crockery, and sanitary arrangements sufficient for temporary use by large numbers of persons have to be improvised. Relays of food are provided as the frightened straggling parties arrive throughout the night, a nurse is on duty all night and a doctor visits the center, and an officer of the Public Assistance Department takes the names and addresses of families ready for the billeting officer when he visits the center after daybreak.

In the morning officers of the local authority—who have probably had no sleep themselves—appear to arrange billets or to provide money for immediate necessities. Billets are in private houses as a general rule, compulsory powers to billet being available; but local authorities have in some cases provided large furnished houses where difficult families can obtain shelter. As a result of experience, these arrangements became so efficient that rest centers were completely cleared in about 48 hours unless, as often happened, another air raid had occurred on the following night. The duration of stay in billets depended upon the amount of damage done to the various houses. Where the blast had not affected the main fabric of the house but had only damaged doors, windows, or roofs, first aid repairs might be completed in two or three weeks, and the family would then return to commence the unenviable task of cleaning the house and putting such furniture as had survived into usable condition.

Some families in Liverpool have been "bombed out" of the same house or successive houses three times or more and are becoming quite used to their stays in rest centers, billets or, as fre-

quently happens, in the houses of friends. Naturally the number of houses completely destroyed or so badly damaged as to be regarded as incapable of first aid repairs is much less than the number affected to a minor extent by blast; and families escaping from the disaster of a demolished or seriously damaged dwelling (usually because they were in a shelter) are difficult to provide for. Like other and more fortunate families, they are taken for the night to a rest center and later provided with billets which they may be required to occupy for months until one of the limited number of unoccupied houses in the city, of a size suited to their means, is available.

During the severe air raids last year the need for small working-class houses was so great that housing standards were relaxed and some dwellings condemned as unfit for habitation by the medical officer of health before the war and awaiting demolition were temporarily brought into service to accommodate the homeless. This action was, admittedly, not justifiable on public health grounds and is one out of many examples of reductions in the standards of hygiene rendered necessary by the categorical imperatives of war. The arrangements for the provision of food and shelter for persons bombed out of their homes should be carefully thought out beforehand in great detail, because upon their satisfactory working during air raids depends, to no small extent, the morale of the people, who will form their judgments of the efficiency of all the local authority's civil defense services largely upon their personal experiences in connection with rest centers and billets.

One of the most important provisions of a complete civil defense scheme for an urban area is a system of air raid shelters properly distributed according to population density in the various districts of the city, each shelter being

fitted with such requirements as heating, lighting, and ventilation so as to be reasonably comfortable during periods of prolonged occupation. Shelter policy in Great Britain, both during and prior to the war, has been the subject of prolonged and at times even acrimonious discussion between those who believed that a relative degree of safety could be secured by substantially built surface shelters and an important group who maintained that a much higher degree of safety was essential and that this standard could only be secured by deep underground shelters. Official opinion has remained strongly in favor of the former policy and, therefore, as far as ordinary domestic communal shelters are concerned, they are (unless local circumstances dictate another method, *e.g.*, tunnelling) surface shelters constructed of brick or concrete and of standard dimensions. There are many types, but the three main kinds of shelters are (1) public shelters, usually situated in strengthened basements under large buildings, intended originally for chance uses in daytime raids, but actually used during the first two years for night occupation; (2) domestic communal shelters, built in rows along one-half of the carriageway of side streets, and situated more or less opposite the houses occupied by the families for which they provide shelter; and (3) shelters of a special type, *e.g.*, the Morrison table shelter designed for use inside the house, the Anderson shelter for use in small gardens or yards and small brick or concrete one-family shelters. The public health department is mainly concerned with public shelters, but there are one or two observations to be made about the other types. Domestic communal shelters—by far the most numerous kind—are situated directly on the road and are commonly built of brick, the walls being 20 inches thick, the walls, roof, and floor being reinforced with steel bars.

They shelter 50 persons and are divided into three compartments, each with an entrance and a door which can be locked. Lighting and an electric heater which also acts as a ventilator are installed, but there are no sanitary conveniences, and water is not supplied as the shelters are close to the houses of the occupants. Some domestic communal shelters are fitted with metal bunks in two tiers but these are not popular except for use by small children and, of course, these fittings reduce the total capacity of the shelters. Difficulties are experienced in some parts of the city in persuading occupiers to keep the shelters allocated to them clean, and it has been necessary to appoint inspectors to deal with cleanliness in public and domestic communal shelters. However, it has been possible recently—in Liverpool—to reduce the number of these inspectors, as the standard of cleanliness has improved, and the provision of doors and locks and the allocation of a specified part of a shelter to each family have materially contributed to the care with which shelters are used—and also to the reduction of wilful damage. Infestation by lice and bed bugs of bedding (which is left in both public and domestic communal shelters during repeated air raids) has always proved a difficulty, and fumigation is required from time to time. Judging from experience of the use of domestic communal shelters of the standard design during a period of nine months of air raids, the verdict may justifiably be passed that they have provided a high degree of protection against blast and splinters (although not, of course, against a direct hit) and a reasonable standard of comfort for the occupants condemned to spend the greater part of a long night in them. They are cheaply built and, being situated near to the occupants' homes, can be quickly reached in a sudden raid and equally quickly vacated as occasion may require.

Public shelters afford protection to between 200 and 2,000 people. They are supplied with washing facilities and sanitary arrangements and light refreshments such as tea, coffee, cakes, and sandwiches are available at low prices. The daily cleaning of public shelters, after a night's occupation, is done by one of the departments of the local authority and, during air raids, shelter wardens are on duty to keep order and occasionally to settle disputes. Difficulties have been caused by a certain amount of drunkenness, and sometimes women of an undesirable character resort to the public shelters. In general, however, the standard of behavior has been good, and the regular occupants, of which there is a surprisingly large number, keep their bedding and belongings at the shelters for weeks or months at a time during air-raiding periods.

I have frequently asked occupants of public shelters why they are there, perhaps far from their homes, rather than in their local domestic communal shelters, and the impression one gets from questioning is that certain types of people, during dangerous periods, obtain a greater feeling of safety when surrounded by numbers of their fellows. There is also more going on at a public shelter as concerts or lectures are sometimes arranged, and the presence of a trained nurse and the visits of the doctor are matters of interest to many of the unsophisticated shelterers. The idea that public shelters are safer than domestic communal shelters is not a matter of fact but of feeling; and public shelters, packed with hundreds of people, are a source of continual anxiety to the administrative officers during air raids, since a direct hit by a large bomb, bringing down much of the building, may cause an enormous casualty list, whereas a bomb of similar size hitting a domestic communal shelter will have a much less damaging effect



because the number of persons is so much smaller. Dispersal is the fundamental principle for safety in air raids, and the occupation of very large public shelters, even if sub-divided into compartments, offends against this principle.

Medical arrangements in connection with public air raid shelters consist of a medical room with a sick-bay adjoining, mainly for isolation purposes, the attendance of a trained nurse throughout the night, and a visit of a medical practitioner to whom children suspected to be suffering from infectious diseases are referred for diagnosis and who, in addition, deals with various minor ailments which seem urgently to need treatment. It is no part of the doctor's duty to treat patients who could well be left to be seen by their own practitioners the next day. The principal reason for his visit and for the attendance of the nurse during the night is psychological, namely, to impart confidence to the occupants of the shelter.

The subject of special shelters, such as the Morrison and Anderson, can be briefly referred to. Both of these types are made of steel and are only supplied to local authorities in limited quantities at the present time, although in the case of the Anderson many were manufactured and distributed from 1938 onward before domestic communal shelters had been built in any numbers. The Anderson is an outside shelter and consists of thin corrugated iron, shaped in the form of a half cylinder, which is sunk in the ground to the depth of a few inches and its sides covered all over with sandbags or a foot of earth. Inside many of them have concrete seating and a concrete floor. On the other hand, the Morrison is an indoor shelter, six feet 6 inches long, and in appearance is like a steel table (and can be used as a table) with metal legs and strong wire mesh sides. Its provision is now restricted to persons who are badly crippled or permanently bed-ridden, a

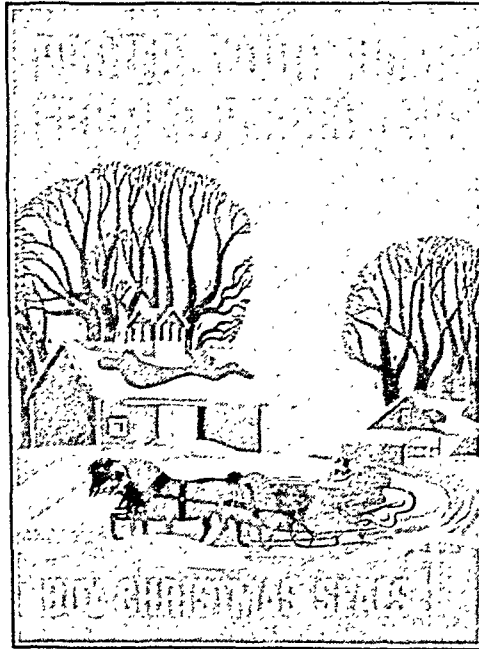
medical certificate, which is strictly scrutinized, being required when applications are received by local authorities.

My last subject is that of day and residential nurseries which are being provided as rapidly as possible for the children of mothers who are engaged in the war factories or on other work of national importance. In many cases the children are looked after by a relative or a neighbor, but it seems obviously desirable on health grounds that as many children as possible under the age for compulsory attendance at school should be cared for, when their mothers are working, by the local authorities in circumstances which insure a satisfactory diet, medical and nursing supervision, and some preliminary education of an informal kind.

For the present at least these nurseries, of which about 800 have already been opened in England and Wales, must be regarded strictly as a war provision; but it is likely that after the war the system will be retained and expanded, mainly in the form of nursery schools and classes, *i.e.*, as part of the Education Service rather than the Public Health Service. Today nurseries are of three main types, namely, those caring for children between the ages of 0-2, 2-5, and residential nurseries. The requirements of mothers working in the war factories vary according to the periods of duty. If a woman is on the three shift system, or for any reason has to work at night, the ordinary nursery caring for children during the day only is of little use to her and she is compelled to have recourse to a residential nursery, of which not many have been established. In general, mothers with children under the age of 5 tend to apply for work in shops or in small factories where a night shift system is not in operation, and for them the day nurseries, open from about 7:30 A.M. to about 6:30 P.M. are an adequate provision. Nurseries established in

elementary school premises and catering to children between the ages of 2 and 5 are usually in charge of the head mistress who is assisted by girls who have had a short course of training; while

nurseries, either in school premises or in adapted houses, which care for children from 0 to 5 are under the control of a matron who is a trained nurse, and she is assisted by a teaching staff.



# Food and Nutrition of the Industrial Worker in Wartime\*

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THE importance of the nutrition of the industrial worker began to be appreciated in this country soon after the outbreak of war in 1939. The character of the war impressed upon us the fact that, perhaps for the first time in history, the responsibility for national defense was shared by every class in the community. Wars could no longer be left to the armed forces and to ordnance plants. Successful defense called for the use of every worker and of every resource in the community. Germany was successful in the first years of the war because she had geared the strength and resources of the entire community into the war effort. It was a war of production; of production needed to keep the community strong, as well as to furnish weapons for the armed forces. The lesson was quickly learned in Great Britain where programs of public health and nutrition were greatly expanded at the very time that the military situation was the most desperate. We have not yet learned this important lesson. Workers upon whose production depends the outcome of battles in distant seas, islands, and con-

tinents are still inadequately fed. In many cases no amount of education in diets would be of very much help, for conditions are such as to make it almost impossible for the worker to obtain a good diet.

It was Great Britain's example which aroused our interest in the subject. There the Ministry of Food decreed that there should be a canteen in every plant employing 250 or more workers. The basis for this action was to be found in a statement of Sir John Boyd Orr:

The improvement of the diet of workmen whose diet was not previously up to the standard for health is followed by increased output without any conscious increased effort and also by a reduction in the number of accidents. Many factories are now providing a meal for employees. It is likely that, as part of the national effort for increased output of war material, the provision of a meal will be made compulsory in all factories and measures be taken to ensure that the meal is on the lines of the Oslo breakfast, which will make good the deficiencies of the portion of the diet eaten at home.<sup>1</sup>

The National Nutrition Conference for Defense, called by the President and held in Washington in May, 1941, adopted a series of recommendations on the diet and nutrition of the defense worker.<sup>2</sup> Perhaps its most important recommendation was that the approval

\* Presented before a Joint Session of the Industrial Hygiene and Food and Nutrition Sections of the American Public Health Association at the Seventy-first Annual Meeting in St. Louis, Mo., October 30, 1942.

of all contracts calling for the construction or expansion of defense plants should include consideration of appropriate facilities for feeding the workers. This was awkwardly worded but the intent was clear. Unfortunately it was never implemented. It is still possible to build a plant in an area where practically no community facilities exist and to make no proper arrangements for feeding the workers. The Conference also recommended that the families of low-income workers (in defense industries) should be included in the distribution of protective surplus foods; it emphasized the importance of conditioning labor recruits nutritionally; and it pointed to the need for controlled studies of diet and nutrition in their relationship to health, working capacity, incidence of accidents, and absenteeism.

The Committee on Nutrition in Industry of the National Research Council took up the challenge of the Conference. In the summer of 1941 Dr. Robert S. Goodhart, vice-chairman of the committee, visited and studied thirty-three defense industries throughout the country. His report made it clear that facilities for feeding the workers were inadequate or lacking in most of the plants; that it was difficult or impossible for the workers to obtain good diets by their own efforts; and that, even when proper foods were available, it was easier and cheaper to purchase meals of nutritionally inferior foods. A controlled study of the diets and nutritional status of approximately 1,500 workers in an airplane plant in the West was organized under the auspices of the committee, and plans were made to start similar studies in several different geographical areas. The committee published its first report *The Food and Nutrition of Industrial Workers in Wartime* in April, 1942,<sup>3</sup> and copies were widely distributed, arousing keen interest among doctors, workers, and employers. Finally, in view of the interest aroused

and the fact that ways to attack the problem were becoming known, the Nutrition Division of the Office of Defense Health and Welfare Services decided to employ a technical consultant in the nutrition of industrial workers and to set up an organization to carry out the work throughout the country. The technical consultant in the Office in Washington is to work through representatives in each of the twelve federal security regions. At least one of these is a physician with some experience with industry and special knowledge of nutrition. Had it not been for the army's need for doctors, many more qualified physicians would have been employed.

In the meantime industry itself had taken a prominent part in the work. Requests for advice poured in from industrial management and medical departments. Several industries undertook carefully worked out programs of education in nutrition, both for the worker and the worker's family. These programs were "sold" to other industries and must have had considerable results. Industrial leaders in Bridgeport, Conn., joined with civic and defense authorities to demonstrate what could be done to improve the diets of industrial workers. The leaven has spread throughout the country, so that at present few industrial leaders can be unaware of the importance of proper food and nutrition for the worker.

When the Committee on Nutrition in Industry started its work, practically no information was available concerning the diets of industrial workers, little or nothing was known of their nutritional status, and no one had gone to the trouble of collecting information concerning the facilities for feeding workers available in war plants. The committee was forced to rely upon indirect evidence, and the advice of experts with practical experience. The committee's reasoning is found in its first published report. It was known that many war

plants were expanding rapidly and that many new plants were being built, some in sparsely settled areas with inadequate facilities for housing, food, and medical care. New workers were being employed and these came in large part from age groups and classes not suitable for the armed forces. Many of them had been unemployed, and the change from light or no work to fairly long hours of concentrated toil, with changing shifts and unaccustomed types of work, must have imposed a heavy strain upon bodies and minds which in so many cases were out of training.

The only available evidence concerning these new workers was derived from an investigation of the nutritional status of a WPA group in New York City. This group was engaged in clerical, messenger, and laboratory work, and had not been very effective, although on the whole competent and willing. Over 26 per cent of 165 adults of both sexes were found to be deficient in blood-plasma ascorbic acid with less than 0.20 mg. per cent. More than 40 per cent had less than 0.40, and over 55 per cent had less than 0.60 mg. per cent. As for the incidence of anemias, 7.6 per cent of the males had less than 14 gm. of hemoglobin per 100 ml. of blood, and 6.8 per cent of the females had less than 12 gm., the minimum limits of the normal range for males and females respectively.

The most common of the deficiencies was avitaminosis A, revealed by characteristic changes in the conjunctiva. Marked changes were found in the eyes in 65 of 143 persons examined, while only one of the entire group was classified as completely normal. In a number of the cases these changes in the conjunctiva have disappeared after long treatment with vitamin A, whereas they are still as marked as ever in a control group.

The committee viewed with some alarm the employment of such nutri-

tionally deficient persons in war plants; they were not likely to get into the armed forces. Hence it recommended that steps should be taken to condition nutritionally those classes of the population who are likely to become workers in war plants. In adopting this recommendation the committee had in mind the startling results obtained in Great Britain when volunteers who had been rejected by the army, mainly for underweight, debility, and deficient chest measurement, were conditioned at the Physical Development Depot at Canterbury.<sup>4</sup> Nearly a thousand rejectees were built up for six months at this depot. Measures for improving the health of the unsuccessful recruits (this was in peacetime) included: 1, optimum diet; 2, long sound sleep; 3, hard physical work; 4, healthy recreation. Milk and fruit were added to the presumably adequate army ration. In addition to four regular meals, a snack was served at 10:30 a.m. (milk or soup and fruit), and the men had tea (tea, biscuits, and barley sugar) in the afternoon.

As a result of this conditioning, 87 per cent of 834 men so treated were accepted and passed into the army. Only 5 per cent were afterward discharged on grounds of medical defect.

This is certainly an economical and simple method of conserving badly needed man power. It could have been carried out easily in CCC camps as well as in NYA, WPA, and defense training schools. It is probable that these agencies have greatly contributed to the efficiency of the men, women, and boys with whom they have dealt. But it would have been well worth while to have made a more ambitious effort to condition, under medical and nutritional guidance, some of the weaker elements among those on whom we now depend for war production.

The committee also based its recommendations in part on the work of Williams, Wilder, and their coworkers,<sup>5</sup>

who showed that a diet sufficiently rich in thiamin to prevent the development of obvious deficiency disease is not necessarily adequate for the best nutritional state of the patient. Larger amounts of this vitamin in the diet increased the alertness and attentiveness of experimental subjects and led to more satisfactory performance on an exercising device; i.e., increased working capacity. Diets deficient in thiamin gave rise to clumsiness leading to numerous small accidents, such as finger cuts and broken dishes. Many authorities believe that thiamin is one of the commonest deficiencies in the American diet. Significant changes in the psychological state of the experimental subject have also been produced by decreasing or increasing the thiamin content of the diet.

The Committee on Nutrition in Industry has now in its possession many more facts concerning the diets and nutrition of industrial workers than were available to it in 1941. The vice-chairman of the committee brought back from his brief survey of thirty-three war plants a general picture of the facilities available for feeding workers in and around such plants, and some idea of what the men had for breakfast. In far too many cases the workers drove long distances to work with little or no breakfast. Sometimes they obtained breakfast at the plant cafeteria and more often than not selected dishes of little nutritional value. At luncheon some of the men ate in the cafeteria if one was available; their choice of dishes was poor in one-third to one-half of the cases. Workers who did not eat in the cafeteria had recourse to lunch boxes, which cause delays because they have to be inspected to prevent possible sabotage. But war plants with adequate cafeterias were almost unknown, and those which did exist did not help the workers to select a balanced meal. In fact, the worker who does select a good meal in the average plant cafeteria is

penalized by having to pay more than the usual price. Thus if the special meal recommended by the cafeteria costs 30 cents, a balanced meal exceeds that cost by varying amounts.

More precise data on workers' diets were furnished by a study of the diets of about 1,100 aircraft workers in Southern California.<sup>6</sup> The report on this study has been elaborated in some detail and cannot be adequately summarized here. Over 55 per cent of the diets were classified as poor as regards consumption of green or yellow vegetables; nearly half were deficient as regards citrus fruit or tomatoes; about a third were poor in milk, a fifth in eggs, but almost all were satisfactory in the amount of lean meat consumed. Only 2 per cent of the diets contained satisfactory amounts of each of the five food groups, while 87 per cent of the diets had amounts definitely below those recommended by the Food and Nutrition Board of the National Research Council.

Two hundred and fifty complete two day diet records (the conclusions above refer to weekly diets) were analyzed to obtain approximate values for their nutritive content. The percentages of the diets in which the amounts of specific nutrients were less than two-thirds of the recommended daily allowances were: protein 0.8 per cent; iron 4.0 per cent; niacin 7.2 per cent; thiamin 14 per cent; vitamin A 14.8 per cent; calcium 24.8 per cent; riboflavin 43.2 per cent; ascorbic acid 46.0 per cent. There were 71.6 per cent of these diets which fell short of two-thirds of the daily allowance in one or more specific nutrients. It is surprising to find that 40 per cent of the men reported diets which furnished less than 140 per cent of basic metabolic needs, as this level of caloric intake is insufficient for men engaged in work involving physical activity.

The workers who reported these diets were medically examined to determine their nutritional status at the beginning

of the study. The results of these examinations have not yet undergone complete analysis, but Dr. Henry Borsook, director of the study, has reported some preliminary findings.<sup>7</sup> Forty-two per cent of slightly less than 1,000 workers had less than 0.5 mg. per cent blood plasma ascorbic acid (17 per cent had less than 0.25 mg. per cent). Nineteen per cent showed signs of premature degeneration of the nervous system as evidenced by loss of vibratory sensation in the toes to a C-256 tuning fork. This is generally accepted as pathological in men under 35 years of age. Forty-seven per cent had localized, elevated conjunctival spots (Bitot's spots); evidence of vitamin A deficiency. Over 28 per cent had a blood hemoglobin content of less than 14 gm. per cent. Capillary invasion of the cornea of the type indicative of riboflavin deficiency was almost universal. The final report of this study will be of the greatest interest, as about half of the men are being treated for their nutritional deficiencies.

It may be noted, in the foregoing, that the percentage of nutritional deficiencies exceeded the percentage of diets deficient in particular nutrient. This is probably accounted for by losses of nutrients in processing, storage, cooking, and standing. Recent evidence on this subject tends to show that these losses are probably very great in practice; as high as 90 per cent in ascorbic acid.

The evidence that has been uncovered in these studies, few and incomplete as they are, cannot be glossed over. Each new survey reinforces and strengthens the case. The war workers, on whom we depend for production of the tools of war, are not adequately fed. A large proportion of them suffer from multiple but mild nutritional deficiencies. Under these conditions optimum health is impossible, and output must suffer accordingly. According to Dr. C. O. Sappington, time lost on account of illness is costing American industry ten billion

dollars a year. Dr. Victor G. Heiser states that ordinary disease such as prevails in the community is responsible for nearly fifteen times as much loss of time as trade hazards and accidents combined. No one knows how much of this absenteeism could be reduced by adequate diets, but every dietary experiment with workers, however incomplete, has shown beneficial results. Sound health cannot be maintained without an adequate diet, and health is the foundation of morale. Ivy<sup>8</sup> states that work demands rest, good food, and wholesome recreation; that physical fitness is essential to sustained effort and output. The rôle of adequate diets in the armed forces should lead us to give equal consideration to the nutrition of our war workers who play so large a part in our defense.

Those who have not been in close touch with this subject can have no idea of the widespread interest among workers and their families, management, communities, and states. This growing interest has extended to industrial physicians who had been taught in the past that the diet and nutrition of workers did not come within the scope of their work. The American Association of Industrial Physicians has set up an active Committee on Nutrition in Industry. The Committee on Industrial Health and Medicine of the National Research Council has held joint sessions with the Committee on Nutrition in Industry, and has adopted all of the latter's recommendations.

Interest among other groups is just as widespread. State Defense Councils have devoted considerable attention to the subject; in New York State two full-time physicians trained in public health have been employed for the purpose of directing this work. State and local committees have organized subcommittees on nutrition in industry, many large plants have employed nutritionists and dietitians, and public

utilities have thrown some of their large resources into the campaign.

This widespread interest in the health and nutrition of the industrial worker gives the alert health department a golden opportunity to make its influence more widely and deeply felt. It gives the health officer a chance to widen the scope of his program; the industrial physician the opportunity to make his work much more effective. No longer is nutrition regarded as something for women and children, for now soldiers, sailors, and airmen as well as war workers come into the picture. We determined after the last war that steps would be taken to fill the gaps in our public health program revealed by the draft examinations. That our efforts were not very effective is shown by the results of present selective service and induction examinations. We should take every advantage of the new knowledge

and the new interest in the field of nutrition to move forward toward our goal, and to banish forever the assumption that dictatorships excel democracies in utilizing advances in science for the benefit of their people.

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# Fuel Oil Rationing Protects Public Health\*

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FUEL oil rationing is a positive program to protect public health against the potential ravages of the critical petroleum transportation shortage. Before the war 95 per cent of all petroleum consumed in the Eastern Area was supplied by tanker shipments. The toll of tankers by Axis submarines, plus diversion of tankers to war use, has reduced this form of transportation to a negligible quantity.

Because petroleum cannot be transported into the East by tankers in adequate quantities, every effort has been made to move petroleum by overland methods. All available tank cars, pipe lines, tank trucks, and barges on inland waterways have been put into service. However, in spite of tremendous increases in this form of petroleum shipment, thus far it has been impossible to supply the East with enough petroleum to fulfil minimum civilian and war production needs. As yet, the petroleum transportation shortage has not hurt the war effort. No war production plant has been forced to close down, nor has any airplane in the interceptor command been grounded for lack of gasoline. Your government hopes, by rationing and supply control, to prevent the fuel deficit from becoming so serious as to force choices among equally unpleasant

options—shut down of war production plants, inadequate supplies for the armed forces, or homes so cold as to endanger health.

To cope with this desperate war production and military supply situation and at the same time adequately safeguard public health, it was necessary to develop a rationing program which would attain several objectives. First, it should provide an effective stimulus to conserve fuel oil by improving burner efficiency, reducing structural heat loss, or converting heating plants to coal in order to make a positive contribution to the reduction of the fuel oil deficit. Second, it should curtail consumption to bring it into consonance with the petroleum transportation shortage and accomplish this curtailment in a fashion to assure equitable distribution of the available supplies. Third, it should take account of the special heating requirements of the young, the aged, and the ill.

Unless fuel oil is rationed and these objectives are attained, public health will be seriously jeopardized. Distribution of the woefully inadequate supply of this vital fluid by happenstance favoritism with no consideration for the high essentiality of hospitals or homes sheltering the ill, the aged, and the very young would result not only in cruel suffering but in an intolerable general health problem.

A positive incentive must be provided consumers to increase the amount of

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heat and health they get from a gallon of fuel oil and thereby make an important contribution to the closing of the deficiency gap between a reduced supply and augmented requirements. This stimulus is provided by the rationing plan in the form of a differential cut depending upon thermal efficiency. Thus the wasteful user who has the greatest need and opportunity for improving thermal efficiency will be cut most, whereas the tight house that has few remaining opportunities to reduce fuel waste is curtailed least.

The effectiveness of this stimulus will be greatly increased if people are adequately advised as to how to improve their thermal efficiency. The public health officer and the medical profession are in a position to contribute importantly in passing on specific advice to consumers about ways of getting optimum health conditions from their fuel oil rations.

Insulation, storm windows and doors, and weather stripping will aid greatly in keeping heat where it will do the most good. An efficient burner properly adjusted, a carefully checked chimney, and a boiler or furnace, and heating pipes that are properly insulated will do much to get the most out of a limited ration by generating heat efficiently. In many cases this equipping and adjusting program will pay for itself in a very short time, not only in greater comfort and better health but in actual cash savings.

There are many other steps which the individual home owner can take to use his fuel ration most effectively. Unused rooms, such as extra bedrooms, and rooms that are notorious heat wasters, such as sun rooms, can be shut off completely. Radiators and registers should be shut off when windows are opened. Window shades can be lowered when light is not needed. Keeping draperies, or anything that interferes with circulation, away from radiators

will greatly increase the efficiency of the heating plant. Fireplaces can be closed off when not in use and thus prevent the escape of heated air. At other times, in mild weather, the fireplace will often provide sufficient heat without using the central heating plant. Great fuel economy results from lowering the temperature for at least 8 hours during the night. Many of these improvements and adjustments cost little or nothing except care and thought.

Under the ration plan, all uses of fuel oil and kerosene—whether for home heating, industrial, commercial, military, or miscellaneous—will be regulated. Every purchase of fuel oil will require the presentation of coupons or equivalent evidences secured from local War Price and Rationing Boards. Only heating uses, however, will be restricted.

In determining the basic home fuel oil ration, the following factors are considered for a private dwelling: (1) a standard heat-loss formula, based on the square foot dwelling area to be heated; (2) the previous heating season's consumption, adjusted for normal weather; (3) the number of occupants in each house. The ration will be affected by the normal temperature of the area in which the establishment is located by the use of a degree day temperature table for each area. The United States Weather Bureau has supplied the degree day information for our use.

The heat loss formula considers the heating requirements of a typical free standing house, possessing standard insulation and burner efficiency under the normal degree day temperature of the area in which it is located. By using two constants, the formula will set a ration range, which makes it possible to classify homes according to thermal efficiency and vary the ration in a way to stimulate improvement in efficiency. If  $66\frac{2}{3}$  per cent of last year's adjusted consumption falls within the formula range, this amount of fuel oil will con-

stitute the ration. If the fuel oil allowance estimated on this percentage basis falls above the range, the maximum of the range will be taken as the ration. If it falls below, then 85 per cent of last year's adjusted consumption, or the minimum of the range, whichever is smaller, will constitute the ration. The formula for determining the ration will not presuppose the achievement of any particular temperature. The temperature inside the dwelling will depend upon the supply of fuel oil available and upon the individual consumer's preference for a higher or a lower temperature for a shorter or a longer period of time.

The individual ration, of course, will be determined by local War Price and Rationing Boards. The basic application blanks will contain the information necessary for the board to determine the ration. Consumers were urged to fill their tanks before the program started. The board will therefore assume that most private houses had full tanks on October 1, and will require additional evidence if the consumer states that his tank was not full. If this evidence is satisfactory, the ration will be tailored to the amount of the actual October 1 inventory.

The heating season has been divided into five periods of approximately equal degree days, and the rationed area has been divided into four thermal zones. Since the calendar distribution of degree days varies from thermal zone to thermal zone, the dates of the heating periods will be different for each thermal zone. Coupons are numbered to indicate the period in which they are valid. The value of the coupons can be changed from period to period to meet unusual weather conditions and unusual factors of supply.

Of particular interest to your group is the provision that has been made for supplemental or auxiliary rations. These may be granted by War Price and Rationing Boards upon demonstration that

a special hardship would result from using the basic ration alone. Under the plan, special provision is made for persons of poor health, those of tender or advanced age who require warmer temperatures. In the case of children, if they are under 4 years of age, that factor alone will be considered justification for rations to heat the home slightly above the average. Where there is sickness or old age, the eligibility for supplemental rations will be determined by certification or prescription of a licensed physician.

This provision places a grave responsibility upon the medical profession. Whenever it is necessary to provide special rations to meet unusual situations there is danger of laxity growing out of misunderstanding of the seriousness of the trust. The laxity in discharging this responsibility will be perilous to public health. The medical profession in certifying to auxiliary rations must guard the health not only of the applicants but also of those who are not eligible for special consideration but whose ration will be reduced if the privilege is abused by others. Abuse of this privilege can undermine confidence not only in the rationing administration but also in the medical profession, and can thereby break down the effectiveness of the entire rationing program. We know that we can depend on your profession effectively to bring to the attention of those members who may tend to be lax and over-generous the fact that not only the rationing program but the nation's entire war effort would be endangered if serious abuses were permitted.

As an aid to you and to your neighbors on the rationing board in assuring effective administration of this provision, a local review committee composed of the public health officer and two members of the medical profession will be selected by the county medical association in most rationed communities.

I am confident that we will receive the active support of the public health and medical profession in this positive program to protect the public health in the face of the critical petroleum supply deficiency. We have sought and followed the advice of the medical profession throughout the development of the

rationing program. We are still seeking your advice. If you feel, at any time, that the plan or its administration can be improved, feel free to tell us so. We want your counsel whenever possible, for we know that the interchange of ideas is necessary to successful waging of the war on the home front.

# Etiology of Acute Illness Among Workers Using Low-grade Stained Cotton\*

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THIS paper presents the results of a further investigation of the etiology of an acute illness among workers using low-grade stained cotton. This illness has been previously reported<sup>1</sup> as occurring among workers in rural mattress making centers, cotton mills, cotton seed processing plants, and upholstering plants, where a very low grade of dusty stained cotton of the 1940 crop was used. Since April, 1941, reports of outbreaks of this illness have been received from 25 states and 2 Canadian provinces, with more than 700 cases reported in one state alone. Illness occurred among workers exposed to high dust concentrations and the severity of the illness varied with the degree of exposure. This disease is characterized by its sudden onset, 1-6 hours after exposure, and the short duration of the acute phase, usually 24-48 hours after exposure. The principal subjective symptoms are conjunctival irritation, substernal oppression, dryness of throat, generalized aches, fatigue, headache, cough, chills, fever, anorexia, nausea, and vomiting.

## INVESTIGATION INTO THE CAUSE OF OUTBREAKS

During the course of this investiga-

tion, 115 samples of cotton, cotton dust, linters, cotton plant debris, cotton seed and soil were received from 14 states, the U. S. Department of Agriculture, and 2 Canadian provinces. These samples are listed in Table 1.

All the samples of cotton incriminated in outbreaks of illness were dusty, low grade and stained, and contained varying amounts of plant debris. The majority of these samples were classified within official grades for tinged and stained cotton by graders of the U. S. Department of Agriculture, and many of them were described as "bolly"<sup>2</sup> in character."

Preliminary chemical studies failed to reveal any extractable fractions, toxic gases, or insecticides present in the cotton which would be capable of causing illness.

## MICROBIOLOGICAL STUDIES

The low incidence of fungi and the infrequent occurrence of pathogenic types of fungi in specimens of stained cotton precluded this class of microorganisms as the cause of the illness.<sup>1</sup>

A microscopic examination of fibers of the stained cotton in moist preparations demonstrated the presence of rod-shaped microorganisms in mucilaginous clumps along the sides of the individual fibers. Fibers of stained and of normal cotton were stained by Gram's method and mounted in balsam. The fibers of

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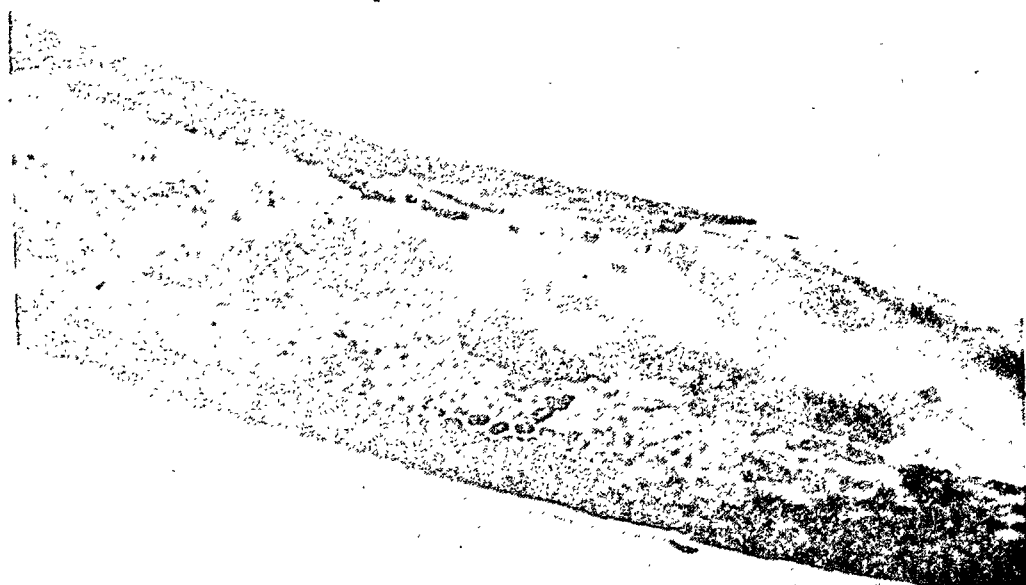


FIGURE 1—Microörganism in Lumen of Stained Cotton Fiber, Gram's Stain

stained cotton were seen to be thin-walled and to contain many short, rod-shaped bacteria within the lumen,<sup>1</sup> whereas the fibers of normal cotton were thick-walled and free of bacteria (Figure 1).

A quantitative bacteriological examination was made of all samples of cotton and other materials received for investigation. A 1:100 dilution of each sample was prepared by aseptically weighing 1 gram of material into 100 ml. of sterile physiological saline in wide-mouth, screw-cap bottles. The bottles were agitated mechanically for 20 minutes. Serial dilutions from 1:1,000 to 1:100,000,000 were made from the resulting suspensions. These dilutions were plated on potato-carrot-dextrose agar.\* Inoculated plates were incubated 24 hours at 37° C. The plates

from all samples of stained cotton showed a heavy growth of large, colorless to pale yellow mucoid, spreading colonies to the exclusion of significant numbers of other types of bacteria (Figure 2). Microscopic examination of isolated colonies showed that the predominating microörganism was a Gram-negative rod. The incidence of this type of microörganism in the various materials examined is shown in Table 1.

Mucoid microörganisms predominated in 73 of the 74 samples of stained cotton from lots known or suspected to have caused illness. The plate counts of mucoid bacteria in these 74 samples ranged from 4,000 to over 5,000,000,000 per gm. of cotton. The same strain of mucoid bacterium, determined biochemically, was isolated from 65 of these 74 samples. This strain or type culture will be referred to in this paper for convenience as the "cotton bacterium." The "cotton bacterium" was also isolated from 3 of 8 samples of

\* Formula: Potatoes, 2,000 gm.; carrots, 500 gm.; dextrose, 200 gm.; magnesium sulfate, 3.0 gm.; sodium carbonate, 2.0 gm.; agar, 150 gm.; and water, 10 liters. pH adjusted to 6.8.

TABLE 1

*Bacteriological Examination of Samples of Material Relative to Acute Illness*

<i>Type of Material Examined</i>	<i>Total No. of Samples</i>	<i>No. of Samples Containing the Cotton Bacterium</i>	<i>Average Plate Count of Mucoid Bacteria per gram</i>
<i>Reported or Suspected to Have Caused Illness:</i>			
Tinged or stained cotton	74	65	678,000,000
Cotton mill dust	3	2 *	5,739,000,000
Bolly cotton seed as it reaches the seed oil plant	2	1 *	38,658,000
Bolly cotton as it reaches the gin	2	2	48,000,000
<i>Obtained from Plants Where Mill Fever or Grain Fever Had Occurred:</i>			
Cotton mill dust	4	3 *	36,125,000
Elevator screenings (grain dust)	4	4	18,150,000
<i>Not Known to Have Caused Illness:</i>			
Stained cotton, various grades obtained from miscellaneous sources	5	2	399,000,000
Stained cotton, various grades, obtained from U. S. Dept. Agriculture for comparison	5	5	159,221,000
Tinged cotton, various grades, obtained from U. S. Dept. Agriculture for comparison	5	2	1,021,000
Tinged or stained cotton, history unknown	3	1	51,700
White cotton, obtained from U. S. Dept. Agriculture for comparison †	9	0	118,000
Soil from ranch on which bolly cotton was grown	2	0	600,000
Cotton plant debris from field of plants infected with angular leaf spot	1	0	.....
Hemp dust collected around a tow shaker in a hemp mill	1	1	1,020,000
Hemp plants, root, stem, leaves and blossom of Kentucky and of Chilean hemp	2	0	5,000

\* An aberrant strain of the mucoid "cotton bacterium" was isolated from the rest of the samples in this classification.

† Included in this group are the 2 samples of high grade cotton used as controls in the experimental work.

stained cotton reported not to have caused illness or on which the history was unknown.

The cotton bacterium was not recovered from the two control samples of high grade white cotton which were used throughout this investigation. The plate counts of miscellaneous microorganisms on these two samples were 13,000 and 110,000 per gm. respectively.

In order to determine the distribution of the cotton bacterium in different grades of cotton, 17 samples representing practically all grades of white, tinged, and yellow stained cotton were obtained from the U. S. Department of Agriculture. The presence of the cotton bacterium was demonstrated in all grades of yellow stained cotton and in two samples of the tinged cotton. The

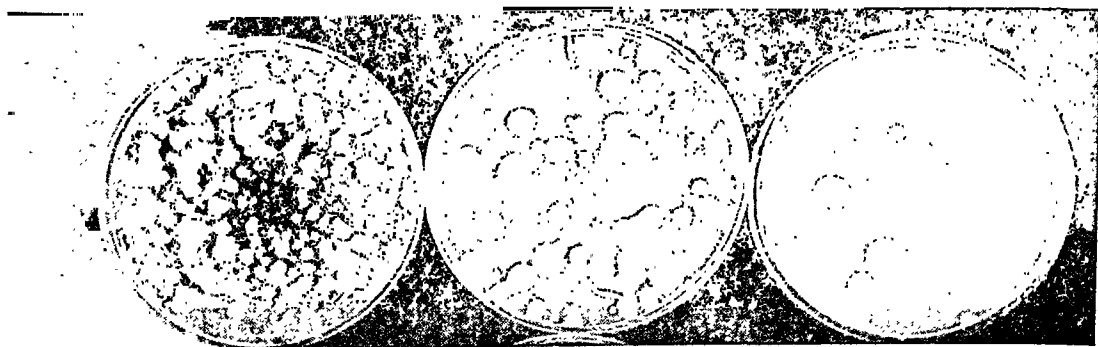


FIGURE 2—Incidence of Mucoid Bacterium in Dilutions of 1:1,000,000, 1:10,000,000 and 1:100,000,000 from a Sample of Stained Cotton

incidence of this microorganism ranged from 1,000 to 670,000,000 per gm. It was not demonstrated in any of the grades of white cotton or in four of the grades of tinged cotton examined. The results of these examinations indicate a possible wide distribution of the cotton bacterium in low-grade tinged and yellow-stained types of cotton.

A sample of cotton collected in 1938 from a cotton mill in which a severe outbreak of "mill fever"<sup>3</sup> had occurred contained this microorganism in excess of 3,000,000 per gm. 3 years after collection.

An intact bale of low-grade stained cotton was obtained from a rural mattress making center in which a severe outbreak of acute illness had occurred. The incidence of the cotton bacterium in this cotton at the time of receipt was 1,100,000,000 per gm. (average of 5 analyses). At the end of one year of storage, the numbers of viable mucoid microorganisms had decreased to 470,000,000 per gm. of cotton.

Two dust samples from a cotton mill and 1 sample from a cotton seed plant in which several cases of this acute illness had occurred revealed the incidence of the mucoid organisms to be 1,200,000,000, 16,000,000,000, and 18,000,000 per gm. respectively. Four samples of dust from cotton mills in which this unnamed illness had not been reported but in which cases of mill fever had previously occurred showed an incidence of mucoid organisms in excess of 1,000,000 per gm. The cotton bacterium was isolated from 3 of these samples.

In connection with a severe outbreak of this illness in one cotton seed processing plant, it was possible to obtain specimens of (a) the soil in which the cotton had grown, (b) intact bolls from cotton plants in the same field in which the incriminated cotton had grown, (c) cotton seed from the plant, (d) cotton lint, and (e) rafter dust

from the linting room of the cotton seed plant. The typical cotton bacterium was isolated from the intact bolls and the cotton seed. An aberrant strain was isolated from the lint and rafter dust. The field soil did not contain this type of organism. The incidence of this general type of mucoid microorganism in these specimens was as follows: cotton from intact bolls, 3,800 to 54,000,000; cotton seed, 1,400,000 to 77,000,000; lint, 14,000,000; and rafter dust, 18,000,000 per gram of material.

This acute illness is similar to heckling fever, mill fever, hemp fever, and grain fever reported in workers inhaling flax, jute, hemp, or grain dust respectively. During these studies it was possible to obtain 4 samples of elevator dust screenings collected in a center where grain fever has occurred and a sample of hemp dust collected around a tow shaker machine in a hemp mill. The typical cotton bacterium was isolated from all of these samples.

Two hundred and fifty representative cultures of the predominating microorganism present in the material under investigation were isolated and purified for further study.

A microscopic examination of all cultures demonstrated that the predominating microorganism was a Gram-negative rod averaging  $2 \times 0.7 \mu$ , heavily encapsulated and actively motile in hanging drop preparations.

All purified cultures were subjected to an extensive series of biochemical studies for purposes of identification and classification. The basic medium employed for the fermentation studies contained 3 gm. of meat extract, 10 gm. of Bacto-proteose peptone No. 3, 5 gm. of C.P. sodium chloride, 0.02 gm. of phenol red or brom thymol blue indicator, and 5 gm. of the fermentable substance per liter. Final pH was 7.4. This medium was used in Durham fermentation tubes.

All observations on fermentation and



TABLE 2

*Morphology and Biochemical Reactions of "Cotton Bacterium"*

<i>Test or Test Substances</i>	<i>Reaction</i>	<i>Test or Test Substances</i>	<i>Reaction</i>
Gram Stain	—	Dextrin	Acid and gas
Capsule	+	Inulin	Slight acid changing to alkaline.
Flagella	+		Slight gas
Motility	+	Starch	Acid and gas
Xylose	Acid and gas	Salicin	" " "
Arabinose	" " "	Glycerol	Acid
Dextrose	" " "	Adonitol	Slight acid changing to alkaline
Levulose	" " "	Dulcitol	Acid and gas
Galactose	" " "	Rhamnose	" " "
Mannose	" " "	Mannitol	" " "
Maltose	" " "	Sorbitol	" " "
Lactose	" " " Slow fermentation at 20 and 37°.	Inositol	Slight acid to alk.
Indole	Negative (—)	Cellobiose	Acid and gas
Methyl Red Test	" (—)	Litmus Milk	Acid, coagulation, and reduction
V.P. Test	+	Russell's Dbl.	Butt—AG
Na. citrate	+	Sugar Agar	Slant—No change or alk.
E.M.B. Agar	Atypical small pink colonies	Lead Acetate	Very slight to negative H <sub>2</sub> S pro- duction
Sucrose	Acid and gas	Gelatin	Liquefaction positive in 4-7 days
Trehalose	" " "	Nitrate broth	Reduction to nitrites
Raffinose	" " "	Urea Medium	Alkaline, very little visible growth
Pigment	Cream color to bright yellow on nutrient agar. Produced best at 20° C.	Hemolysis	Negative

other tests requiring prolonged incubation were made after 24 hours and 7 days. Where reaction developed slowly a 21 day incubation period was used.

Cultures of the mucoid microorganism giving identical biochemical reactions were isolated from 70 of the 81 samples of stained cotton or other materials incriminated in outbreaks of this acute illness, as well as from 17 of 29 samples of stained or tinged cotton and other materials not incriminated in outbreaks of the illness. Aberrant strains of this microorganism were isolated from 10 of the samples in which the typical cotton bacterium could not be demonstrated.

The typical morphological characteristics and biochemical reactions of the cotton bacterium are listed in Table 2.

On the basis of its morphological characteristics and its biochemical reactions, the cotton bacterium has been tentatively placed in the genus *Aerobacter*.

## PATHOGENICITY AND TOXICITY TESTS

*Recovery of cotton bacterium from*

*cases of illness*—Blood specimens and nose and throat swab cultures were obtained from approximately 40 individuals, who had contracted this sickness and from 10 control individuals, who had not had the disease. The cotton bacterium was never isolated from blood cultures obtained from cases nor from nose and throat swab cultures except in a limited number of cases in which the swabs were taken during or immediately after the illness.

*Pathogenicity of cotton bacterium to animals*—A series of experiments was carried out with animals to determine the pathogenicity of the cotton bacterium and the toxicity of filtrates obtained from broth cultures of this organism and from saline extracts of stained cotton. One to two ml. of these filtrates were the minimum quantities required to kill rabbits weighing 1.5 to 2.0 kg. The intranasal application of the cotton bacterium in several species of animals did not produce any ill effects. Massive doses of cotton bacterium cultures and culture filtrates were required to kill mice and guinea pigs when injected intraperitoneally.

TABLE 3

*Dolman and Hammon Tests for Toxin*

Cat No.	Weight Kg.	Injections			Reaction	
		Type	Quantity ml.	Material	Time Hrs.	Symptoms
1	1.30	Intraperitoneal	5.0	Filtrate 7 day tryptose broth culture boiled 20 min.	4	Vomiting
2	1.42	Intravenous	3.0	"	3	Vomiting—Died within 24 hrs. — Autopsy findings negative
3	1.25	Intraperitoneal	5.0	Filtrate from saline extract of stained cotton boiled for 20 min.	24	No reaction
4	0.64	Intravenous	4.0	"	4	Diarrhea and vomiting
5	0.80	Intraperitoneal	5.0	Filtrate from 7 day tryptose broth culture boiled for 20 min.	2½	Vomiting
6	0.80	Intravenous	3.0	"	4	Diarrhea and slight vomiting—Died within 4–21 hrs. Autopsy findings neg.
7	0.62	Intraperitoneal	5.0	Filtrate from saline extract of good cotton boiled 20 min.	24	No reaction
8	0.75	Intravenous	5.0	"	24	" "
9	0.91	Intraperitoneal	5.0	Sterile tryptose broth	24	" "
10	0.94	Intravenous	5.0	"	24	" "

*Dolman and Hammon tests for enterotoxin*—A gastrointestinal upset, accompanied by nausea, vomiting, and sometimes diarrhea, were among the symptoms occurring in cases of this illness. It, therefore, seemed advisable to test filtrates from broth cultures of the cotton bacterium and saline extracts of stained cotton by recognized tests for the detection of enterotoxin.

One of the most widely accepted tests for the detection of staphylococcus enterotoxin is the intra-abdominal kitten test, first described by Dolman, Wilson, and Cockcroft.<sup>6</sup> This test involves the intraperitoneal injection of 3.0–5.0 ml. of specially prepared culture filtrates into young kittens after the inactivation of lethal exotoxins by heat, formalin, or by neutralization by specific antitoxin. After a variable period of time, enterotoxic filtrates produced vomiting and diarrhea.

Hammon<sup>7</sup> recently reported an improved intravenous injection method, which is claimed to eliminate non-specific or false positive reactions due to peritoneal irritation. In performing this test, the test materials are injected into the saphenous vein of the leg of mature cats without anesthesia. The

dosage varies from 0.5 ml. to 5.0 ml. depending upon the potency of the toxin. The toxic filtrates must, of course, be treated to inactivate the lethal factors before injection.

Cats weighing 600 to 1,400 gm. were employed in these tests. All culture filtrates and cotton extract filtrates were heated to boiling for 20 minutes before injection.

The dosages employed and the results obtained with each method of administration are recorded in Table 3.

These tests demonstrated that Berkefeld filtrates from 7 day tryptose broth cultures of the cotton bacterium and saline extracts of stained cotton contained heat-stable toxic substances capable of inducing vomiting and diarrhea in cats. Gastrointestinal symptoms were not induced in the control animals either through the intravenous or intraperitoneal injection of sterile tryptose broth or Berkefeld filtrates from saline extracts of normal cotton.

*Pathogenicity of the cotton bacterium on cotton seedlings*—In order to ascertain whether the cotton bacterium was capable of infecting cotton plants, cotton seedlings were grown in large flower pots that had been swabbed with mer-

cury bichloride, dried, and filled with sterilized top soil. The cotton seed used was examined for contaminants before planting. Sterile battery jars were used to cover the germinating seed and to insure a humid atmosphere.

Seedlings grown from seed that had been incubated in a tryptose broth culture of the cotton bacterium for 24 hours at 37° C. immediately before planting and seedlings that were irrigated with broth cultures of the cotton bacterium appeared to be normal and like the control plants over a period of one month. The leaves of normal seedlings, cleansed by swabbing with alcohol and inoculated by a needle prick or by rubbing a broth culture of the cotton bacterium on the underside of the leaves, did not develop lesions. Positive control plants similarly inoculated with *Phytomonas malvacearum* developed leaf spots. Negative controls treated with physiological saline and with sterile tryptose broth did not develop lesions.

The cotton bacterium could not be recovered from the leaves of cotton seedlings one month after inoculation; however, it was recovered from top soil

three months after inoculation. As a result of these tests, it was concluded that the cotton bacterium is not pathogenic for cotton seedlings under the conditions of these experiments.

Hopkins<sup>4</sup> described two species of bacteria causing an internal rot of cotton bolls. From the meager descriptions given, it appears that one of these microorganisms is similar to the typical cotton bacterium which has been isolated during this investigation. He states that these bacteria are capable of decomposing and staining the immature cotton fibers within the boll. Other portions of the cotton plant are not attacked.

#### SEROLOGICAL STUDIES

Because this acute disease resembles an intoxication rather than an infection and because of the high incidence of the cotton bacterium in stained cotton to the exclusion of other miscellaneous types of microorganisms, the following serological studies were undertaken to ascertain whether the cotton bacterium liberated a toxic substance which might be capable of inducing the symptom complex.



FIGURE 3—Necrotic Areas Denote Positive Shwartzman Reactions Produced by Berkefeld Filtrates from 48 hour and 7 day Tryptose Broth Cultures of the Cotton Bacterium

*Shwartzman reaction*<sup>5</sup>—This reaction, using mature rabbits as the test animals, is employed to demonstrate "the phenomenon of local skin reactivity to certain toxic substances." These substances are generally derived from bacteria. In demonstrating this phenomenon, sensitivity is induced by intradermal injections (preparatory injections) of 0.25 to 0.5 ml. of the toxic substances. Reactivity is induced by intravenous injections (reacting injections) of 1.0 to 3.0 ml. of the toxic filtrates per kg. body weight, 24 hours after the preparatory injections. A positive Shwartzman reaction is evidenced by a severe hemorrhagic necrosis, usually beginning within 4 hours after the reacting injection at the site of the intradermal injection. These sites become swollen and dark blue with a red border. A typical positive Shwartzman reaction is shown in Figure 3. Animals are prepared for test by clipping or by epilating the skin of the flank with barium sulfide 24 hours prior to the initial injection.

The material tested in these studies included heated and unheated Berke-

feld filtrates from 7 day tryptose broth cultures of the cotton bacterium, heated and unheated filtrates from saline extracts of stained cotton, and filtrates from saline extracts of normal cotton. Sterile tryptose broth and sterile physiological saline (0.85 per cent NaCl) were employed as control solutions.

The results of a representative series of Shwartzman tests are shown in Table 4.

These experiments revealed the following: (a) A heat-stable endotoxin-like substance is liberated by the mucoid cotton bacterium; (b) a similar toxic substance is present in filtrates from saline extracts of stained cotton incriminated in outbreaks of illness; (c) that rabbits may be cross sensitized with filtrates from either source; and (d) that this endotoxic substance is not present in filtrates from saline extracts of normal cotton, in sterile tryptose broth or physiological saline.

It was also demonstrated by the Shwartzman reaction that homologous immune sera prepared through rabbit immunization with culture filtrates of the mucoid cotton bacterium, and with

TABLE 4

*Shwartzman Reaction Tests for Endotoxin*

Rabbit No.	Weight Kg.	Sensitizing Injections		Reacting Injections		Skin Reaction		
		* Material	Quantity ml.	* Material	Quantity ml.	Degree	Type	
1	3.81	D	0.25	D	1.25	++++	Hemorrhagic	necrosis
2	3.74	D+Se	0.25	D	1.25	—	No reaction	
3	2.43	K	0.25	K	1.0	++++	Hemorrhagic	necrosis
4	3.42	F	0.25	F	8.0	++++	"	"
5	2.92	F	0.25	D	3.0	++++	"	"
6	4.44	D	0.25	F	9.0	++++	"	"
7	3.52	G	0.25	G	5.0	—	No reaction	
8	2.96	G	0.25	D	1.5	—	"	"
9	2.31	D	0.25	G	9.0	—	"	"
10	3.60	F	0.25	G	8.0	—	"	"
11	2.31	T	0.25	T	5.0	—	"	"
12	2.66	T	0.25	D	1.5	—	"	"
13	3.65	D	0.25	T	9.0	—	"	"

\* D = Berkefeld filtrate from 7 day tryptose broth culture "cotton bacterium"

Se = Rabbit immune serum

K = saline suspension from 13 hour potato-carrot-dextrose agar slant culture of "cotton bacterium" heated to boiling for 30 min.

F = Berkefeld filtrate from saline extract of stained cotton

G = Berkefeld filtrate from saline extract of good cotton

T = sterile tryptose broth (Bacto)

saline extracts of stained cotton contained antibodies capable of neutralizing the endotoxin-like substance present in these materials.

*Agglutination tests*—These tests were employed to determine (a) whether antibodies are produced in human or animal serum in response to the introduction into the body of viable or killed cultures of the cotton bacterium, filtrates of broth cultures (endotoxin) of the bacterium, and filtrates from saline extracts of stained cotton, (b) whether antibodies for the cotton bacterium are present in normal human or animal serum, from individuals not known to have had this illness or animals which have not received immunizing injections, (c) whether antibodies are produced in rabbits, in response to the introduction of filtrates from saline extracts of normal cotton, free from the cotton bacterium.

The sera tested were as follows: (a) human sera obtained from individuals in several states who had had the acute illness 24 hours to several weeks prior to the time of obtaining the sera; (b) sera obtained from 4 baboons at known intervals after a 7 hour exposure to stained cotton, (c) sera obtained from rabbits given repeated, intermittent, intravenous injections of saline suspensions of viable and killed organisms, Berkefeld filtrates from 24 and 48 hour and 7 day tryptose broth cultures of these organisms, and filtrates from saline extracts of stained cotton, (d) control sera obtained from individuals not known to have had the illness, from 1 baboon not exposed to stained cotton dust, from a rabbit injected with a filtrate of a saline extract of normal cotton, and from a normal non-immunized rabbit.

The antigens used for these tests consisted of filtered, standardized uniform suspensions of 18–24 hour potato-carrot-dextrose agar slant cultures of the typical bacterium isolated from cotton

samples which had been implicated in outbreaks of the acute illness.

The *method* consisted of diluting the serum in the usual manner with sterile physiological saline throughout a range from 1–10 to 1–5,120; 0.5 ml. of antigen was added to each dilution and after thorough mixing, all agglutination tubes were incubated in a constant temperature bath at 37° C. for 2 hours, followed by refrigeration at 5° C. overnight. Many of the human sera, including some of the controls, and all baboon sera contained variable low titer agglutinins for the cotton bacterium. The explanation for this fact is unknown. However, it would seem to indicate that because the cotton bacterium is closely related to certain types of bacteria commonly found in the intestinal tract of primates, it may be agglutinated by their antibodies. It would also indicate that a marked production of antibodies in the blood is not stimulated by exposure to the cotton bacterium or its toxic products, under the conditions described herein.

Identical antibodies, *i.e.*, antibodies capable of agglutinating typical culture antigens of the cotton bacterium, were produced in rabbit blood through immunizing injections with all saline suspensions of viable and killed organisms, by Berkefeld filtrates from 24 and 48 hour and 7 day tryptose broth cultures, and by filtrates from saline extracts of stained cotton. No agglutinins for the cotton bacterium were produced by those rabbits injected with filtrates from saline extracts of normal cotton, nor were such agglutinins present in the blood serum of normal non-immunized rabbits. The maximum agglutinin titers of these immune sera for typical cultures of the cotton bacterium are shown in Table 5.

Each animal was bled and the agglutinin titer of the immune serum was checked at intervals throughout a period of one year. There was a tend-

TABLE 5

*Maximum Agglutination Titer of Rabbit Immune Sera*

Antigen = Uniform Saline Suspension of "Cotton Bacterium"

Serum No.	Serum Dilutions										Serum Control	Antigen Control
	1/10	1/20	1/40	1/80	1/160	1/320	1/640	1/1280	1/2560	1/5120		
1	4+	4+	4+	4+	4+	4+	2+	2+	2+	+	—	—
2	4+	4+	4+	4+	4+	4+	4+	4+	3+	3+	—	—
3	4+	4+	4+	4+	4+	4+	3+	2+	+	±	—	—
4	4+	4+	4+	4+	4+	4+	3+	3+	2+	+	—	—
5	4+	4+	4+	4+	4+	3+	3+	2+	+	±	—	—
6	4+	3+	3+	3+	3+	3+	2+	2+	+	—	—	—
7	—	—	—	—	—	—	—	—	—	—	—	—
8	—	—	—	—	—	—	—	—	—	—	—	—

\* Serum 1 = Rabbit immunized with a saline suspension of a "cotton bacterium" culture obtained from an 18-24 hr. growth on an agar slant

" 2 = Same as rabbit 1 except the suspension was heated in a boiling water bath for 20 min.

" 3 = Rabbit immunized with a filtrate from an 18-24 hr. tryptose broth culture

" 4 = Rabbit immunized with a filtrate from a 48 hr. tryptose broth culture

" 5 = Rabbit immunized with a filtrate from a 7 day tryptose broth culture

" 6 = Rabbit immunized with a filtrate from a saline extract of stained cotton

" 7 = Rabbit immunized with a filtrate from a saline extract of normal cotton

" 8 = Normal rabbit serum

TABLE 6

*Agglutination Tests Showing Decrease in Antibody Titer*

Antigen: Uniform Saline Suspension of "Cotton Bacterium"

Serum: Rabbit Immunized with a Filtrate from Tryptose Broth Culture of "Cotton Bacterium"

Bleeding No.	Date of Test	Serum Dilutions										Serum Control	Antigen Control
		1/10	1/20	1/40	1/80	1/160	1/320	1/640	1/1280	1/2560	1/5120		
*1st	9/10/41	4+	4+	4+	4+	4+	3+	2+	±	—	—	—	—
2nd	9/25/41	4+	4+	4+	4+	4+	4+	3+	2+	+	±	—	—
3rd	11/13/41	4+	4+	4+	4+	3+	2+	2+	+	+	+	—	—
4th	11/27/41	4+	4+	4+	3+	2+	+	+	±	—	—	—	—
5th	3/ 9/42	4+	4+	3+	2+	+	±	—	—	—	—	—	—
6th	4/17/42	4+	4+	3+	2+	+	±	—	—	—	—	—	—
7th	5/19/42	4+	3+	2+	+	±	—	—	—	—	—	—	—
8th	6/22/42	4+	4+	3+	2+	+	—	—	—	—	—	—	—
9th	7/16/42	3+	3+	2+	2+	+	±	—	—	—	—	—	—
10th	8/18/42	4+	3+	2+	+	±	—	—	—	—	—	—	—

\* The first test was carried out before immunization was complete

TABLE 7

*Agglutination Tests Showing Decrease in Antibody Titer*

Antigen: Uniform Saline Suspension of "Cotton Bacterium"

Serum: Rabbit Immunized with a Saline Extract of Stained Cotton

Bleeding No.	Date of Test	Serum Dilutions										Serum Control	Antigen Control	Remarks
		1/10	1/20	1/40	1/80	1/160	1/320	1/640	1/1280	1/2560	1/5120			
*1st	9/10/41	4+	4+	4+	4+	4+	3+	2+	±	—	—	—	—	
2nd	9/25/41	4+	3+	3+	3+	3+	3+	2+	2+	+	—	—	—	
3rd	10/21/41	4+	4+	4+	4+	3+	2+	2+	+	±	—	—	—	
4th	11/18/41	4+	4+	3+	2+	2+	+	—	—	—	—	—	—	
5th	12/15/41	3+	3+	2+	+	—	—	—	—	—	—	—	—	
6th	1/25/42	4+	3+	2+	+	±	—	—	—	—	—	—	—	
7th	3/ 9/42	3+	3+	2+	+	±	—	—	—	—	—	—	—	
8th	4/17/42	3+	2+	2+	—	±	—	—	—	—	—	—	—	
9th	5/19/42	3+	2+	+	—	±	—	—	—	—	—	—	—	Rabbit died 5/11/42. No further tests.

\* The first test was carried out before immunization was complete

ency for the titer of the serum to decrease gradually with increasing length of time after the last injection of the antigen. This is shown in Tables 6 and 7, which show the decrease in the agglutinin titer of the immune sera obtained through immunization with culture filtrates of the typical cotton bacterium and with filtrates from a saline extract of stained cotton. These immune sera were utilized to separate the cultures isolated from the cotton samples into a number of serological groups. These tests demonstrated that the majority of the organisms isolated from stained cotton belonged to the same, or closely related serological groups.

*Precipitation tests*—These tests were carried out with two of the types of blood serum available for this investigation, *i.e.*, human and rabbit sera, which were obtained or prepared as described under the general discussion of agglutination tests. These studies were undertaken in order to ascertain whether blood sera from human cases of this illness or rabbit immune sera, prepared as previously described, contained antibodies capable of precipitating pre-

cipitinogens prepared from cultures of the cotton bacterium and saline extracts of stained cotton.

Two precipitinogens were employed for these tests. One was prepared from an 18 hour tryptose broth type culture of the cotton bacterium by Lancefield's<sup>8</sup> method; the other was prepared from a physiological saline extract of stained cotton by filtration through a Berkefeld N-candle and concentration by vacuum distillation at 30–32° C.

The procedure for these tests consisted in placing 0.2 ml. of undiluted serum in the bottom of each of nine 3 mm. tubes. Four-tenths ml. of the antigen, both undiluted and that diluted with sterile physiologic saline, over a range of 1:5 to 1:320 was then laid over the serum with a capillary pipette. One tube containing 0.4 ml. of undiluted antigen and 0.2 ml. of physiologic saline and a second tube containing 0.2 ml. of serum and 0.4 ml. of physiologic saline were prepared for controls. The tubes were incubated for 30 minutes at room temperature and then observed for ring formation. Incubation was continued for 2 hours at

TABLE 8

*Precipitin Tests on Immune Rabbit Sera*

Precipitinogen: "Cotton Bacterium" culture prepared by Lancefield's Method

Rabbit Serum Nos.*	Antigen Dilutions								Serum Control	Antigen Control
	Undil.	1/5	1/10	1/20	1/40	1/80	1/160	1/320		
1	4+	4+	4+	3+	2+	+	±	—	—	—
2	4+	4+	4+	4+	2+	+	+	—	—	—
3	3+	2+	2+	+	+	+	±	—	—	—
4	3+	3+	2+	2+	2+	+	+	±	—	—
5	3+	3+	2+	2+	2+	+	±	—	—	—
6	4+	3+	3+	2+	2+	+	±	—	—	—
7	±	—	—	—	—	—	—	—	—	—
8	—	—	—	—	—	—	—	—	—	—

Precipitinogen: Vacuum distillate from stained cotton extract filtrate

1	3+	3+	3+	3+	2+	2+	+	—	—	—
2	4+	4+	3+	3+	2+	2+	+	±	—	—
3	3+	+	±	—	—	—	—	—	±	—
4	3+	2+	2+	±	—	—	—	—	—	—
5	3+	3+	3+	2+	2+	+	±	±	±	—
6	3+	3+	2+	2+	+	±	—	—	—	—
7	3+	—	—	—	—	—	—	—	—	—
8	3+	—	—	—	—	—	—	—	—	—

\* These serum Nos. refer to the same rabbit sera listed in Table 5. Serum nonphenolated.

37° C., the tubes then thoroughly agitated and stored at 5° C. overnight. Final examination for precipitates was then made.

Most of the human sera, including the controls, gave positive precipitation tests in low dilutions with both precipitinogens. Rabbit sera from normal non-immunized animals and from the animals injected with filtrates from a saline extract of normal cotton did not show any significant precipitin titer. All other rabbit sera gave positive precipitation tests with both precipitinogens. The results of the precipitation tests with rabbit sera are shown in Table 8.

The results of these tests indicate (a) that sera from rabbits immunized with viable or killed cultures of the cotton bacterium, Berkefeld filtrates from tryptose broth cultures of this organism, or with filtrates from saline extracts of stained cotton, contain high titer precipitins for the precipitinogenic substance in the cotton bacterium, and (b) that stained cotton contained an extractable substance which is precipitated by these immune sera.

#### BIOLOGICAL STUDIES

*Animal exposure tests*—Animal exposure experiments were undertaken in an attempt to discover some species of animal susceptible to this acute disease, which appeared to be due to the endotoxin-like substance present in stained cotton.<sup>1</sup> Baboons, kittens, hamsters, guinea pigs, monkeys, rabbits, and chickens were exposed to various types of cotton dusts for one or more 7 hour periods. While three of the baboons exposed to unsterilized stained cotton developed mild symptoms of the disease, none of the other animals exhibited any symptoms. It was concluded from the results of all animal exposure tests that none of the common experimental animals are very susceptible to this unnamed illness.

*Human exposure experiments*—Since this illness could not be definitely produced in any of the species of laboratory animals tested, human exposure experiments were undertaken. These experiments have already been reported in detail<sup>1</sup>; hence they are only summarized at this time. Three test individuals were exposed for 10 minutes to each type of cotton dust investigated. Two control individuals were exposed to normal cotton dust for 10 minutes on every occasion when the test individuals were exposed to other types of cotton. A week or more was allowed to elapse between the exposures to each type of cotton material. Each individual was given a complete physical examination prior to each exposure. Records were kept of the temperature, pulse rate, respiratory rate, changes in blood picture, and development of symptoms.

The three test individuals did not reveal any signs or symptoms after exposure to normal cotton, nor did the two control subjects, who were repeatedly exposed to normal cotton dust under the same conditions, show any signs or symptoms incident to such exposure. Two of the test individuals developed minor symptoms of illness subsequent to exposure to sterilized stained cotton. It is thought that these mild symptoms were due to minute quantities of the heat-stable endotoxin, which were not destroyed by sterilization.

The same type of disabling illness was produced experimentally in the three test individuals by inhalation of (a) dust from normal cotton contaminated with the cotton bacterium and its products, and (b) dust from stained cotton containing a high incidence of the cotton bacterium. This illness was characterized by its sudden onset, 1½ to 3 hours after exposure, its short duration, i.e., 24–72 hours, and sudden high leucocytosis with a moderate increase in band and segmented cells.

One test individual was exposed for



one minute to a fine mist of a sterile Berkefeld filtrate from a 7 day tryptose broth culture of the cotton bacterium several weeks after exposure to the stained cotton dust. Symptoms of illness began within 45 minutes. Signs and symptoms were identical in type, severity, and duration with those noted after exposure to the dust from stained cotton. The exposure of four individuals for one minute to a fine mist of sterile tryptose broth of the same type as employed for toxin production by the cotton bacterium failed to produce any signs or symptoms of illness.

It is evident that the illness following these exposures was caused by the endotoxin-like products of the cotton bacterium. The symptoms of this illness were similar to those reported in outbreaks of illness occurring among workers in industries using low-grade stained cotton.

The three individuals who had experienced repeated attacks of experimentally induced illness through exposure to contaminated or stained cotton dust and the two control individuals who had been repeatedly exposed to the dust from normal cotton were given intradermal injections with 0.1 ml. of the test materials.

Berkefeld filtrates from broth cultures of the cotton bacterium and from the saline extracts of stained cotton caused severe skin reactions and systemic symptoms within 3 hours in the individuals who had been exposed to normal cotton dust, as well as in the three individuals who had experienced attacks of illness. These reactions were characterized by marked erythematous swelling, which was extremely painful on pressure. The three test individuals and one control subject experienced headache and generalized muscular pains within 10 hours. Two of the test subjects and one control subject had a severe lymphangitis and lymphadenitis of the arm. None of the five individuals

developed any significant skin reaction following the intradermal injections of sterile tryptose broth, sterile physiological saline, or the filtrates from the saline extract of normal cotton. The nature of the skin reactions denoted a definite intoxication rather than a sensitization to the substances injected.

#### DISCUSSION

As previously discussed,<sup>1</sup> the symptomatology and other findings encountered in an acute illness among workers using low-grade stained cotton except for their greater severity are similar to those in the so-called mill fever and Monday fever found in cotton mill workers. These diseases follow the inhalation of cotton dust. While the cause of these diseases has never been completely explained, they have been attributed to (a) the action of the cotton dust on the mucous membranes of the respiratory passages,<sup>9</sup> (b) histamine<sup>9</sup> present in cotton dust, and (c) to the irritating soluble proteins present in microscopic particles of cotton dust.<sup>10</sup>

Mill fever has never been attributed to bacteria or their toxic products. However, the British Departmental Committee on Dust in Cardrooms in the Cotton Industry in 1932<sup>9</sup> reported the presence of large numbers of Gram-negative bacilli in cotton dust. No importance was attributed to these bacteria since no factor common to the bacteriology of the dust and the patients' sputum was found.

From the results of the work in this laboratory, it seems logical to assume that the toxic products of the cotton bacterium responsible for illness among workers in rural mattress making centers and in cotton seed plants using low-grade stained cotton, may also be the etiologic agent responsible for mill fever or Monday fever.

#### SUMMARY AND CONCLUSIONS

The results of a further investigation

into the etiology of an acute illness among workers using low-grade, stained cotton are presented.

One hundred and twenty-two samples of stained, tinged, and normal cotton, cotton dust, linters, cotton seed, soil, hemp dust, and grain elevator screenings were studied.

Samples of cotton incriminated in outbreaks of illness contained no toxic gases, chemically extractable substances, insecticides, or pathogenic fungi to which the illness could be attributed. These samples, however, contained a Gram-negative, rod-shaped bacterium in numbers ranging from 3,000,000 to more than 10,000,000 per gm. It was not isolated from high-grade cotton. Seventy of 81 samples of materials reported to have caused illness contained the same strain of the bacterium as determined by biochemical tests. This bacterium is actively motile and encapsulated. Its Imvic reaction is — — + +; it ferments lactose and liquefies gelatin slowly, and it produces acid and gas in almost all differential media except adonitol, inositol, and inulin. On the basis of these biochemical findings, it has been tentatively placed in the genus *Aerobacter*.

A heat-stable, endotoxin-like substance was demonstrated in filtrates from saline extracts of stained cotton, in filtrates from broth cultures of the cotton bacterium, and in killed suspensions of the same organism. Homologous antibodies, which were capable of neutralizing or precipitating this toxic substance, were produced in rabbits through injections with these materials. It is believed that this toxic substance is in the nature of an endotoxin because of its (a) heat-stability, (b) lower antigenic capacity, and (c) increase with age of culture or destruction of cells.

The same type of disabling illness could be produced in humans by inhalation of (a) dust from normal cotton contaminated with the cotton bacterium

and its culture filtrates, (b) dust from stained cotton containing a high incidence of the cotton bacterium, and (c) a fine mist of a sterile filtrate from cultures of this microorganism. The severity of symptoms and physical findings are dependent upon the presence and concentration of the cotton bacterium or its products in the cotton dust inhaled and upon the duration of exposure.

Intradermal injections of the filtrates of stained cotton extracts and culture filtrates of the cotton bacterium in man resulted in the production of severe inflammatory lesions characteristic of an intoxication rather than a hypersensitivity.

The clinical findings developed experimentally in humans were the same as those reported in cases of acute illness among workers exposed to high concentrations of stained cotton dust. The clinical syndrome of this illness is similar to that of an acute intoxication. Since this acute illness closely resembles mill fever, Monday fever, and gin fever in cotton mill workers, heckling fever, mill fever, grain fever, and hemp fever reported in workers inhaling flax, jute, grain and hemp dust respectively, it is suggested that the toxic products liberated by the cotton bacterium or some closely related species may be the etiological agent for these diseases.

It was concluded that the acute illness occurring among workers using low-grade stained cotton is caused by the inhalation of an endotoxin-like substance produced by a Gram-negative rod-shaped bacterium contained in or on dust from stained cotton. This microorganism has been tentatively placed in the genus *Aerobacter*.

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## Public Health Degrees and Certificates Granted in the United States and Canada During the Academic Year 1941-1942\*

THE Committee on Professional Education of the American Public Health Association presents a report of public health degrees and certificates granted in the academic year 1941-1942. With the exception of the public health nursing tables, the committee has

included only graduate students enrolled in courses leading to graduate degrees and certificates. The basis for the record is *the number of students who received degrees* rather than the number of degrees granted in the specified period.

### Graduate Students Enrolled and Degrees Granted in Public Health Engineering and Sanitary Engineering Courses in the Academic Year 1941-1942

TABLE 1

Name of University	Number of Graduate Students Registered	Graduate Degrees Offered	Number of Students Receiving Each Degree
Agricultural & Mechanical College of Texas	8	M.S. Ph.D.	2 0
Cornell University	1	M.C.E.	1
Harvard University	47 <sup>1</sup>	M.S. Sc.D. E.S.M.D.T. Certif. <sup>2</sup>	13 2 24
Iowa State College	2	M.S. Ph.D.	2 0
Johns Hopkins University	6	Dr.Eng. M.C.E. M.P.H.	2 0 2
Massachusetts Institute of Technology	18	S.M. M.P.H. Sc.D. Ph.D. Dr.P.H. C.P.H.	2 7 1 1 1 2
New York University	28	M.C.E. Dr.Eng.Sc.	5 0
Pennsylvania State College	1	Ph.D.	0
Rutgers University	0	M.S. M.A. Ph.D. M.Ed. Dr.Ed.	0 0 0 0 0
Stanford University	2	Eng. in C.E.-San. Eng.	0

\* For previous reports see *A.J.P.H.*, Vol. 31, p. 1306; Vol. 30, p. 1456; Vol. 29, p. 1338; Vol. 28, p. 863; Vol. 27, p. 1267; Vol. 26, p. 819; Vol. 25, p. 341; Vol. 23, p. 1124.

<sup>1</sup> 3 part-time students

<sup>2</sup> 19 in 3 or 4 month full-time courses for the Navy or Public Health Service

<sup>3</sup> Engineering, Science and Management Defense Training Certificate

TABLE 1 (Cont.)

<i>Name of University</i>	<i>Number of Graduate Students Registered</i>	<i>Graduate Degrees Offered</i>	<i>Number of Students Receiving Each Degree</i>
University of Alabama	1	M.S. in San. Eng. M.S. in P.H. Eng.	0 0
University of California	2	M.S. in San. Eng.	2
University of Illinois	2	M.S. Ph.D.	0 0
University of Kansas	0	M.S.	0
University of Michigan	22	M.S.P.H. M.S.P.H.E. M.S.E. M.S. M.P.H.	2 2 1 5 3
University of Minnesota	8	M.P.H. M.S.	0 0
University of Missouri	6	M.S. in C.E. (San.)	2
University of North Carolina	6	M.S. in San. Eng. M.S.P.H. M.P.H.	2 0 0
University of Toronto	3	M.A.Sc.	3
West Virginia University	0	M.S.C.E.	0
Totals	163		89

**Classification of Graduate Engineering Degrees and Certificates Granted  
in the Academic Year 1941-1942**

TABLE 2

<i>Degree or Certificate</i>	<i>Number of Students Receiving Degrees</i>	<i>Number of Schools Offering Each Degree</i>
Doctor of Philosophy	1	6
Doctor of Public Health	1	1
Doctor of Engineering	2	1
Doctor of Science	3	2
Doctor of Engineering Science	0	1
Master of Public Health	12	5
Master of Science in Public Health	2	2
Master of Science in Public Health Engineering	2	2
Master of Science in Sanitary Engineering	4	3
Master of Science in Civil Engineering	2	2
Master of Science in Engineering	1	1
Master of Science	24	9
Master of Civil Engineering	6	3
Engineer in Civil Engineering	0	1
Certificate in Public Health	2	1
Engineering, Science and Management Defense Training Certificate	24	1
Doctor of Education	0	1
Master of Education	0	1
Master of Arts in Science	3	1
Master of Arts	0	1
Total	89	

In the academic year 1940-1941, 130 graduate students were enrolled in public health engineering and sanitary engineering courses as compared with 163 in the academic year 1941-1942. Graduate degrees and certificates granted in the academic year 1940-1941 totaled 59 as compared with 89 in the year 1941-1942.



TABLE 3 (Cont.)

Name of Institution	Total Number of Graduate Students Registered	Physicians	Dentists	Nurses	Health Educators	Public Health Engineers	Sanitarians	Public Health Laboratory Workers	Statisticians	Nutritionists	Veterinarians	Teachers	Non-Medical Administrators	Physical Educators	Unclassified	Graduate Degrees Offered	Number of Students Receiving Each Degree and Certificate
University of California	1	1	..	..	..	..	..	..	..	..	..	..	..	..	..	A.M.	1
University of Kentucky	6	4	..	..	..	..	..	..	..	..	..	..	..	..	2	M.S.P.H.	2
University of Michigan	81	32	8	..	26	..	7	5	3	..	..	..	..	..	..	{Dr.P.H. M.P.H. M.S.P.H.	2
University of Minnesota	14	9	..	..	..	..	2	1	..	..	..	..	..	..	2	{M.S.P.H. M.P.H. M.S.	20 39
University of North Carolina	48	9	..	..	1	..	22	7	1	..	1	3	..	..	4	{Dr.P.H. Ph.D. M.P.H. M.S.P.H. C.P.H.	0 2 2 2 7
University of Pennsylvania	32	20	..	..	..	..	..	..	..	..	1	..	..	..	11	{Ph.D. M.P.H. M.S.	4 10 1
University of Toronto	24	24	..	..	..	..	..	..	..	..	..	..	..	..	..	D.P.H. <sup>1</sup>	19
Yale University	37	11	1	1	11	2	2	5	1	1	..	..	2	..	..	{Dr.P.H. Ph.D. M.P.H.	1 2 2
Totals	466	259	13	2	49	3	35	29	5	1	3	5	2	1	59		10

<sup>1</sup> Diploma in Public Health  
<sup>2</sup> Diploma in Veterinary Public Health

**Classification of Public Health Degrees and Certificates Granted  
in the Academic Year 1941-1942**

(Exclusive of Engineering and Nursing Degrees and Certificates)

TABLE 4

<i>Degree or Certificate</i>	<i>Number of Students Receiving Degrees and Certificates</i>	<i>Number of Schools Offering Each Degree and Certificate</i>
Doctor of Public Health	11	8
Doctor of Science	14	2
Doctor of Philosophy	8	3
Master of Public Health	139	8
Master of Science in Public Health	71	6
Master of Science	4	3
Diploma in Public Health	19	2
Certificate in Public Health	2	4
Master of Arts	1	1
Diploma in Veterinary Public Health	0	1
Total	269	

In the academic year 1940-1941, 658 graduate students were enrolled as compared with 466 in the academic year 1941-1942. Graduate degrees and certificates granted in the academic year 1940-1941 totaled 332 as compared with 269 in the year 1941-1942.

**Degrees and Certificates Granted in Public Health Nursing Courses for the  
Academic Year Ending June 30, 1942**

Table 5, below, indicates the number of students who received degrees and certificates for the academic year ending June 30, 1942. These figures have been compiled by the National Organization for Public Health Nursing and are printed here with permission.

TABLE 5

<i>Name of University</i>	<i>Number of Students Receiving Each Degree and Certificate</i>		
	<i>Baccalaureate Degrees</i>	<i>Masters Degrees</i>	<i>Certificates</i>
Catholic University of America	1	0	6 <sup>1</sup>
Columbia University	24	12	0 <sup>2</sup>
Duquesne University	0	0	2
George Peabody College for Teachers	24	4	77
Indiana University	10	0	10
Loyola University	4	0	24
Marquette University	1	0	15
Medical College of Virginia	0	0	16
New York University	.. <sup>3</sup>	.. <sup>3</sup>	.. <sup>3</sup>
Richmond Professional Institute, College of William and Mary	7	0	50
St. John's University	0	0	2 <sup>1</sup>
St. Louis University	9	0	1
Seton Hall College <sup>4</sup>	0	0	0 <sup>1</sup>
Simmons College	1	0	41
Syracuse University	9	0	21
University of Buffalo	3	0	1
University of California, Berkeley	33	0	0 <sup>1</sup>
University of California, Los Angeles	6	0	20
University of Chicago	3	0	0 <sup>1</sup>
University of Hawaii	0	0	5
University of Michigan	3	0	31
University of Minnesota	378	0	.. <sup>2</sup>
University of North Carolina <sup>4</sup>	0	0	0

<sup>1</sup> Certificates not granted but course meets in full N.O.P.H.N. requirements for accreditation

<sup>2</sup> Information not available

<sup>3</sup> Information not given

<sup>4</sup> Newly approved in 1942

(Continued)



TABLE 5 (Cont.)

Name of University	Number of Students Receiving Each Degree and Certificate		
	Baccalaureate Degrees	Masters Degrees	Certificates
University of Oregon	8	0	36
University of Pittsburgh <sup>4</sup>	1	0	0
University of Washington	7	3	33
University of Wisconsin	3	0	0 <sup>1</sup>
Vanderbilt University	2	0	17
Wayne University	1	0	23
Western Reserve University	4	3	51
Totals	542	22	482

<sup>1</sup> Certificates not granted but course meets in full N.O.P.H.N. requirements for accreditation<sup>4</sup> Newly approved in 1942

## Summary of Degrees and Certificates Awarded to Nurses in 1941 and 1942

TABLE 6

	1941-1942	1940-1941
Baccalaureate degrees granted	542	339
Masters degrees granted	22	42
Certificates granted	482	568

## General Summary Table of Degrees and Certificates Granted in All Schools Covered in This Report During the Academic Year 1941-1942

TABLE 7

Doctor of Public Health	11
Doctor of Public Health (Engineering)	1
Doctor of Science	14
Doctor of Science (Engineering)	3
Doctor of Philosophy	8
Doctor of Philosophy (Engineering)	1
Doctor of Engineering	2
Master of Public Health	139
Master of Public Health (Engineering)	12
Master of Science in Public Health	71
Master of Science in Public Health (Engineering)	2
Master of Science in Public Health Engineering	2
Master of Science in Sanitary Engineering	4
Master of Science in Civil Engineering	2
Master of Science in Engineering	1
Master of Science	4
Master of Science (Engineering)	24
Master of Civil Engineering	6
Master of Arts	1
Master of Arts in Science	3
Masters Degrees (Nurses)	22
Baccalaureate Degrees (Nurses)	542
Diploma in Public Health	19
Certificate in Public Health	2
Certificate in Public Health (Engineering)	2
Certificates (Nurses)	482
Engineering, Science and Management Defense Training Certificate	24
Total	1,404

W. P. SHEPARD, M.D., *Chairman*

# Effect of Aluminum Hydroxide Sedimentation, Sand Filtration and Chlorination on the Virus of Poliomyelitis\*

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IT has been well established that the virus of poliomyelitis occurs in the feces of patients with this disease and of healthy contacts, and in sewage. Since the pollution of water with this virus is thus possible, and since aluminum hydroxide sedimentation, sand filtration, and chlorination are extensively used in water purification procedures, it seemed advisable to determine whether treatment by these methods inactivated or removed the virus.

## ALUMINUM HYDROXIDE SEDIMENTATION AND SAND FILTRATION

In experiments on the effect of aluminum hydroxide sedimentation and sand filtration, the DG strain of virus, isolated from the stool of a poliomyelitis patient by Dr. S. D. Kramer, was used. This strain had a minimal infective dose of approximately 0.00002 gm. of monkey passage spinal cord at the beginning of these experiments, which increased in the course of this study to 0.001 gm. A sand filter for laboratory use was constructed according to a modified plan of

Baylis.<sup>† 1</sup> This filter consisted of a glass tube 5' long and 2" in diameter, which was supported in a vertical position, and contained 1' of washed coarse gravel at the bottom of the tube, above which was layered 2' of Ottawa silica sand, of which 10 per cent passed a sieve of 0.508 mm. pore size and 60 per cent passed a sieve of 0.630 mm.; the uniformity coefficient (60 per cent. divided by 10 per cent) was 1.24. The 2' space above the sand was filled with water. The tube was fitted with a glass stopcock at the bottom, and a support above the filter held a bottle, from which water could be siphoned into the top of the tube. Before using, the apparatus was filled with chlorinated water and allowed to stand for at least 12 hrs. It was then drained, and back-washed with distilled water until the overflow water was clear and contained no residual chlorine.

In a preliminary experiment the filter was tested for its ability to remove *Escherichia coli* from water which had been previously treated with aluminum sulfate and allowed to settle. Three one gallon bottles were filled with water and enough of a 4 to 6 hour broth culture of *E. coli* was added to each to produce a final concentration of ap-

\* This work was aided by a grant from the Clara Ward Sedgely Clinic for the Study of Infantile Paralysis.

<sup>†</sup> The plan was submitted by H. A. Faber, the CMI Inc. Institute, Inc., New York, N. Y.

TABLE 1

*The Effect of Aluminum Hydroxide Sedimentation and Sand Filtration on the Removal of Poliomyelitis Virus from Infected Water*

Experiment No.	Aluminum Sulfate in Grains per Gallon	pH	Poliomyelitis in Mankeys Inoculated with:		
			Sedimented and Filtered Water	Supernatant of Sedimented Water	Control
1	24	7.1	1/2	0/1	1/1
2	8	7.8	0/2	0/2	1/1
3	8	7.6	1/2	1/1	1/1

proximately 50,000 organisms per ml. Eight grains of aluminum sulfate\* were added to each bottle, and the contents stirred rapidly for 1 min., then slowly for 9 min. The resultant floc was allowed to settle for 3½ hrs., at which time each bottle's contents was filtered, allowing sufficient floc to enter the filtering system to form a layer over the sand 2–3 mm. thick. The rate of filtering was adjusted to 2 gal. per sq. ft. per min. in order to approximate that used in municipal water purification plants.<sup>2</sup> An agar plate culture of the effluent was made after two-thirds of the contents of the third bottle was filtered. Since this method removed 99.6 per cent of the *E. coli*, it was considered satisfactory.

The same technic was then used for testing the effect of aluminum sulfate treatment and filtration on the removal of poliomyelitis virus from river water. The pH of the water was adjusted to 7.0 to 8.0, the water autoclaved, and to each of three gallon samples was added infected monkey cord to produce a final concentration of 0.001 gm. of cord per ml. One ml. samples of the supernatant of the aluminum sulfate treated water and the filter effluent were inoculated intracranially into monkeys, and a control suspension containing 0.001 gm. of monkey cord was likewise inoculated. The monkeys were ob-

served for approximately 40 days, when they were killed, and the central nervous system examined microscopically for evidence of poliomyelitis. No monkey was considered to have poliomyelitis unless characteristic lesions were observed microscopically, even though the animal had shown suspicious neurological signs.

In Experiment 1 (Table 1), virus was not detected in the unfiltered supernatant fluid of the aluminum sulfate treated water, but was demonstrated in the filter effluent. In Experiment 2, no virus was found in either the supernatant or the effluent. In Experiment 3, virus was detected in both. It is thus apparent that virus was not consistently removed from the supernatant fluid by the settling of the aluminum hydroxide alone, nor was the virus removed in two out of three experiments by a combination of the aluminum sulfate treatment and filtration.

In the usual water purification plant procedure, no exact measurement of the concentration of aluminum hydroxide is made following the addition of sufficient aluminum sulfate to form an optimum floc. It was noted in our work that there was a marked difference in the amount of sediment formed when a selected amount of aluminum sulfate was added to a volume of water, depending on whether the sample was river water or distilled water, and also on other factors, such as pH and the rate of adding the aluminum sulfate to the water. Because of these differences

\* One grain was contained in 1 ml. of a stock suspension of 17.12 grams of aluminum sulfate per liter.

the following procedure\* was used to measure exactly the amount of sediment formed. A 10 ml. sample of water in which a floc had formed was placed in a Hopkins tube and centrifuged at 500 times gravity for 10 min. The volume of sediment was then measured.

In testing certain samples of artificially contaminated water, it was noted that occasionally virus was found in the resuspended sediment when none was found in the supernatant or in the control suspensions. This actual concentration by aluminum hydroxide was noted by Schaeffer and Brebner.<sup>3</sup> In

TABLE 2

*Concentration of Aluminum Hydroxide Sediment Necessary to Remove Poliomyelitis Virus from Inoculated Water*

Experiment No.	pH	Aluminum Sulfate in Grains per Gallon	Concentration of Sediment in ml./liter	Poliomyelitis in Monkeys Inoculated with:	
				Supernatant of Sedimented Water	Control
4	7.3	8	0.60	2/2	0/1
	6.9	16	1.16	0/2	0/1
	6.7	32	2.20	0/2	0/1
5	7.0	8	0.40	1/2	2/2
	6.9	16	1.03	1/2	2/2
	6.7	32	1.50	0/2	2/2

The concentration of precipitate present when virus was removed from artificially contaminated water was next determined. It was found in Experiments 4 and 5 (Table 2) that virus was not removed from the water when the amount of aluminum sulfate added resulted in a volume of 0.60 or 1.03 ml. of sediment per liter. Volumes of 1.16 and 1.50 ml. per l. were adequate to produce non-infective inoculums. These amounts of precipitate were compared with the amounts in samples of water obtained from the flocculating basins of four water purification plants in Southern Michigan. In each of three of these samples (Table 3), the concentration was less than 1.16 ml. per l., which was the quantity required to remove the virus from artificially infected water. In the water from one plant, 8 ml. per l. was found, which according to these experiments was more than adequate to sediment the virus.

our experiments, aluminum hydroxide sediments were produced in samples of

TABLE 3

*Concentration of Aluminum Hydroxide Sediment Found in Samples of Water from Purification Plants*

Plant Number	pH	Concentration of Coagulant Added in p.p.m.	Concentration of Sediment in ml./liter
1	7.5	15.2	0.26
2	7.4	12.0	0.14
3	8.9	42.0	8.00
4	7.5	9.3	0.20

water to which virus had been added, and monkeys were inoculated with suspensions of the resuspended sediment as well as with the supernatant fluid. Monkeys were also injected with samples of the inoculated water to which no aluminum sulfate had been added. Only monkeys inoculated with the resuspended sediment from the water containing 0.56 ml. per l. developed poliomyelitis, as evidenced by paralysis and histological examination of the spinal cords (Table 4, Experiments 6 and 7).

\* This method was suggested by Dr. W. J. Nungesser, University of Michigan Hygienic Laboratory.

TABLE 4

*Concentration of Poliomyelitis Virus by Means of Aluminum Hydroxide Sedimentation*

Experiment No.	Concentration of Sediment in ml/liter	Poliomyelitis in Monkeys Inoculated with		
		Supernatant of Sedimented Water	Resuspended Sediment	Control Suspension
6	0.56	0/2		
	1.02	0/2	1/1	0/2
7	0.56	0/2		
	1.20	0/2	1/1	0/2

#### THE EFFECT OF CHLORINATION ON THE POLIOMYELITIS VIRUS

In a previous publication<sup>4</sup> it was demonstrated that 1.50 p.p.m. of chlorine in the form of chloramine inactivated in 20 min. a suspension of spinal cord infected with MV virus, but that 0.86 and 1.00 p.p.m. for 20 min. failed to inactivate. The virus remained viable after exposure for 1 hr. to 0.90 p.p.m., and even after 4 hrs. exposure to a chlorine concentration of 0.2 p.p.m. These studies were continued to determine the concentration of chlorine required to inactivate 2 strains of virus in the time of chlorine exposure used in the average chlorination plant.

In further experiments on the effect of chlorination the MV and DG strains were used, with minimal infective doses of approximately 0.001 and 0.0001 gm., respectively, of infected spinal cord. Because of expense, and the unreliability of tests in monkeys of the minimum dose to produce paralysis, these doses were not accurately determined.

In Experiment 8 (Table 5) river water was used, and the source of chlorine was sodium or calcium hypochlorite. The chlorine content of the water was determined by the orthotolidine and starch-iodide methods. Approximately 0.70 ml. of a 1:10 suspension of spinal cord infected with the MV strain was added to each of several 100 ml. samples of water and various amounts of chlorine were then added. These were allowed to stand for 20-25 min., at which time chlorine

determinations were made and 1.00 ml. of each specimen was inoculated intracranially into a monkey. Failure of the chlorine to inactivate the virus was evidenced by the subsequent development of paralysis in the monkeys with histopathology compatible with that of acute poliomyelitis. Inactivation of the virus was determined by absence of paralysis or tremors in the surviving animals, which were exercised daily during the 40 day period of observation. One and five-tenths p.p.m. of chlorine inactivated the virus and 1.00 p.p.m. was the maximum concentration tested which failed to inactivate the virus.

TABLE 5

*Effect of 25 Minutes Exposure to Chlorine on MV Virus*

Chlorine in p.p.m.		pH	Effect on Virus
O-tol *	SI †		
0.20	0.70	7.0	Not inactivated
0.60	0.40	7.3	" "
0.85	....	8.2	" "
1.00	....	8.3	" "
0.55	1.50	7.0	Inactivated
1.50	....	8.2	Inactivated

\* Chlorine content determined by orthotolidine method.

† Chlorine content determined by starch-iodide method.

In Experiment 9 (Table 6) tap water was used and the effect of chlorine gas dissolved in water on the DG strain of virus was tested. The chlorine content of the water was determined by the starch-iodide test only, because of color interference encountered in the orthotolidine reaction. The rest of the technic was that of Experiment 8. It was found that the amounts of chlorine

required to inactivate the DG strain did not differ markedly from that required to inactivate the MV strain. One p.p.m. inactivated the virus, while 0.90 p.p.m. just failed to inactivate.

TABLE 6

*Effect of 25 Minutes Exposure to Chlorine  
on DG Virus*

<i>Chlorine in p.p.m.*</i>	<i>pH</i>	<i>Effect on Virus</i>
0.45	7.1	Not inactivated
0.50	7.1	Inactivated
0.90	8.0	Not inactivated
1.00	7.1	Inactivated
1.60	7.1	"
1.90	8.0	"

\* Chlorine content determined by starch-iodide method.

#### SUMMARY

Experiments on the effect of aluminum hydroxide sedimentation and sand filtration, and further studies of chlorination on the poliomyelitis virus are described. The virus was not removed from water by aluminum hydroxide sedimentation and filtration methods which removed 99.6 per cent of *E. coli*. Virus was removed from an

artificially inoculated water by producing an aluminum hydroxide sediment of 1.50 ml. per l. The virus was not inactivated by this procedure, however, but remained in an increased concentration in the sediment. Samples from three of four water purification plants selected at random did not contain a sufficiently high concentration of aluminum hydroxide to sediment the poliomyelitis virus.

The concentration of chlorine which inactivated the MV strain was 1.50 p.p.m. for 25 min.; while the DG strain was inactivated by 1.00 p.p.m. but not by 0.90 p.p.m. for 25 min. These concentrations of chlorine are in excess of those recommended for the production of bacteriologically safe drinking or swimming pool water.

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# Surveys of the Nutrition of Populations\*

Description of the Population, General Methods and Procedures,  
and the Findings in Respect to the Energy Principle (Calories)  
in a Rural Population in Middle Tennessee

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THE growing appreciation of the importance of nutrition and the realization that mild nutritional deficiency states are frequent in the general population have made nutrition an important concern to public health services. At the same time the development of improved procedures for the detection of nutritional deficiencies in their earlier and milder forms, before the development of obvious lesions, has suggested that methods might be developed for use by public health agencies to detect these deficiencies and make surveys of nutrition of populations as in the epidemiological investigation of other diseases. Such studies would, of course, provide the information and background necessary for the prevention and cure of such important disorders. With this thought in mind we have made a survey of the nutrition of a population with the purpose of developing methods suitable for public health use, demonstrating their effectiveness and securing information as to the nutrition of the group selected.

Surveys of nutrition are of various kinds and can be made in different ways depending on the purpose of the survey

and the available facilities. At present the term is usually considered to mean a study which includes both a record of food consumption and an assessment of the state of nutrition of the individual subjects.

Studies of food consumption have long been used as a method of measuring the nutrition of populations. Such studies have yielded very valuable information but the method is indirect and relatively inaccurate. It determines the state of nutrition by an inference; the subject is found to eat so much of this and that food containing certain amounts of the different nutritive factors, therefore his nutritive state is judged to be thus and so. At the present time this method is insufficient by itself. It was used in the past mainly because satisfactory methods for assessing the state of nutrition by physical examination or laboratory tests were lacking. Such methods have however been devised and improved so that now they offer the possibility of determining the actual state of nutrition by direct and objective methods. The study of food consumption, however, remains an important part of a survey of nutrition because of its function in determining the etiology and epidemiology of dietary deficiencies. Furthermore, for the present it offers a check and control of other methods of assessing nutrition, an im-

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\* The studies referred to herein were conducted under the auspices of the International Health Division of the Rockefeller Foundation of New York City by the Nutrition Unit of the Departments of Medicine and Biochemistry of the Vanderbilt University School of Medicine, Nashville, Tenn.

portant function in the period of trial of new, direct, and objective tests. For these reasons a complete survey of nutrition, one that includes both a study of diets and an assessment by examination and laboratory tests, is desirable. The scope and thoroughness of these two procedures will vary with the needs and purpose of the survey and the facilities that are available for it.

For our purposes the complete survey was employed. The area selected was a portion of Wilson County, Tenn., about 15 miles from Nashville. It was chosen as a representative area\* of Middle Tennessee, predominately rural, but containing a village community with a limited number of tradesmen, professional people, and skilled workers. A number of the inhabitants worked at a nearby rayon plant, driving to and from their work.

Topographically, the country is rolling and borders on the Cumberland River. The soil is predominately a clay of limestone origin, rather shallow but much of it good. Areas of poorer soil and, in particular, rocky cedar glades are interspersed among areas of the better soil. The type of agriculture is general, diversified farming. County and home demonstration agents and similar organizations are present.

Among the reasons for the selection of the area aside from its suitability as a representative area were its distance from Nashville which facilitated the work of the survey, the existence of an active full-time county health service, and a community spirit which promised a satisfactory coöperation in the study.

If it be objected that this in itself may

have affected the representative average character of the area it may be said that such a spirit was by no means unanimous and that the existence of a considerable amount of civic interest and activity together with a significant lack of it in some groups are characteristic of the region.

Considerable effort was made to explain the proposed survey to the people and secure their coöperation. Visits were made to meetings of civic clubs, women's clubs, parent-teacher associations, the Grange, the schools, and similar organizations. Key persons in the community, teachers, leading farmers, civic leaders, and others were called upon, the procedure was explained, and their coöperation and help were solicited. Help was obtained from the county health officer who offered his assistance and that of his staff in sponsoring and explaining the procedure, and provided an introduction to many elements of the community. In particular, each doctor in the vicinity was visited, not only those actually living in the area but also those who might have patients in the area. All participation by the subjects was voluntary and unremunerated. It may be of interest that it was solicited on the basis of a contribution to public health, to science, and to humanity generally rather than of benefits that might be received by the subjects.

The actual survey consisted of a record and study of food consumption on both a household and individual basis, a medical history, physical examination, and various laboratory tests. Only part of the details of these procedures will be presented here; complete details for each of the nutritive factors investigated will be given with the reports of the study of each of those factors. The present report deals with the characteristics of the area and the population, the general procedures employed, and the state of nutrition in respect to the energy factor (calories).

\* The area originally selected was larger and contained about 2,500 inhabitants. It was thought that only about 60 per cent of the inhabitants would coöperate in the study, giving some 1,200 subjects, the number desired. Preliminary experience, however, indicated that about 90 per cent would coöperate, and consequently the size of the area was reduced to that shown, with a population of about 1,300.



## GENERAL PROCEDURES

The study and record of the food consumption were made by and under the direction of one of us (R.K.). The general procedure followed is described below and will apply to subsequent reports, but the variations, special procedures, and methods used for the study of each of the particular dietary factors except calories will be described in the respective reports.

After preliminary visits to secure cooperation, to explain the procedures, and to make necessary arrangements, a group of households\* was selected containing such number of individuals and located so that it could be managed by a single field worker with time for one visit daily to each family during the period of study.

The day before starting the record of food consumption the household was again visited and a roster was prepared, each individual receiving a household number and an individual number. Date of birth, length of time in the household, and occupation of each were obtained and the earnings of each and of the household as a whole were ascertained and recorded. The member or members of the family who were to keep the records were instructed in the procedure and the forms to be used. They were told that the investigators would return the next morning to help them with details of weighing and measuring, and not much stress was laid on these matters at this visit. The responsible member or members of the household were instructed in the recording of food purchased, produced at home, and received as gifts. In some instances the household inventory of food was made at this time. In other cases this was done the following day. Every effort was made to prevent any changes in the food

habits, and the subjects were informed that a second examination would be made in the following fall or spring.

Some time after the food consumption was studied and recorded, within two weeks in the majority of cases, the medical history was obtained and the physical examination and laboratory tests were made.† For this purpose the subjects were visited in their homes or were brought to the schools of the district or to Vanderbilt Hospital. When examined away from home appointments were made by the field workers, usually at their last visit, and transportation was arranged. For the most part the attendance for examination was easily managed at the first trial but because of conflict with their occupations, particularly with farmers, it was sometimes necessary to arrange more than one appointment and with a small percentage of "stragglers" several attempts were necessary before the examination was completed.

Because it was necessary for the adaptometer (photometer) test, and preferable for the x-ray studies that the patients come to the hospital, many of the subjects, particularly the adults, were examined there. However, examining rooms and facilities for obtaining blood and other material for laboratory tests were set up at the consolidated school which accommodated all the white children in the area. Many of the white children were examined and had specimens obtained there. Similar arrangements were made at the smaller schools for Negroes. Such subjects came to the hospital for the x-rays and adaptometer tests at a later time.

## METHODS

On the first day of the record period (7 days), the field worker called and the record as prepared to that point was

\* Household is used in place of family because the unit of study included not only members of a family but all others for whom it was the principal source of meals.

† In a few instances the examination and laboratory tests were made first and the diet record obtained afterward.

reviewed. Measurement was stressed and the use of cups and spoons as well as the classification of fruits and vegetables into large, medium, and small, or by diameter or length, was made clear, often with a practical demonstration. Recipes for mixed dishes, the methods of recording amounts of various ingredients and the type of cooking used for various foods and dishes were discussed. Additional information and instructions were given and any mistakes corrected. Similar visits were made on the succeeding days of the period and sometimes several daily visits were made. If necessary the investigator went to the home at each meal and recorded the food eaten but this was rarely necessary. At the last visit appointments were made for the medical examination, instructions were given for the collection of urine specimens and similar procedures, and transportation arranged.

For the household inventory and purchase record all the food in the house was weighed, measured, and counted at the start of the seven day period, by a member of the family and the field worker. Weights of loose food were checked and packaged food inspected for net weight and losses. Because most of the subjects were farmers there were often large amounts of potential food available—eggs, hams, truck gardens, etc., but this was not included unless it was present and available at the start of the recording period for early consumption. Forms were provided on which food purchased, received as gifts, or produced at home (garden truck, eggs, milk, etc.) were recorded. At the end of the period another similar inventory was made.

For determining the food consumption of the individual the food actually eaten each day was recorded either by the individual himself or by some member of the household for three days during the week. For many of the sub-

jects these were non-consecutive days and every effort was made to avoid periods containing unusual days. Food eaten away from home and quasi-food such as candy, soft drinks, and alcoholic beverages were included. The intake of breast milk was noted but the milk was not analyzed nor the amount measured.

The quantity of food was measured as it was eaten from the plate either cooked or as otherwise prepared for eating. Measurement was by household measures using standard cups for such foods as cereals, various vegetables, soups, milk, etc. Smaller amounts were measured by the tablespoon and teaspoon with level measure. Volume and weight of such common household measures were checked by actual testing. The amount of such foods as breads, cake, meat, biscuits, etc., was determined by three dimension measurements and reference to a prepared table for the weight of various sized portions. Fruits and vegetables commonly eaten in the whole state, cooked or raw, such as bananas, whole potatoes, apples, and the like were designated as large, small, or medium according to standard practice with the food tables employed. Kitchen waste (except losses in cooking) was not a factor and table waste was controlled closely by recording only food eaten in so far as possible. The general table waste was a minor feature in this study.

Individual recipes were obtained for nearly every composite dish. For example, more than twenty recipes for pies were used in the calculation of dietary intake and four or five recipes for slaw. Proper allowances for changes in weight and volume caused by heat, dilution with water, and other procedures of preparation and cooking were made according to the type of cooking used, following standard practices.

For the calculation of the dietary intake various standard tables of food values were used as far as possible. The

tables used were as follows: For calories, carbohydrate, protein, fat, included in the present report, Tables XIV, XVIII, and XIX of *A Laboratory Handbook for Dietetics*, by Mary Davies (Swartz) Rose,<sup>1</sup> supplemented when necessary by values from *The Fundamentals of Nutrition*, by Hawley and Maurer-Mast,<sup>2</sup> the *Farmers' Bulletin*, "Rabbit Raising," U. S. Department of Agriculture,<sup>3</sup> and *The Structure and Composition of Foods*, by Winton and Winton.<sup>4</sup> Details of the sources of food values for other specific nutrients will be given with the respective reports on those factors. Analyses by the respective companies or general commercial recipes were used for commercial candy bars, cakes, cookies, and similar foodstuffs. Finally, in a few instances, when reported analyses were not available, values were assigned arbitrarily on the basis of general knowledge, similarity to other food, etc. All of these values were combined into "working tables"\* where the various sources are indicated and where household measures are reduced to standard weights and sizes. Here also are the various recipes, notes, and similar data.

When necessary, adjustments were made for the seasons according to the tables. Vitamin values refer to raw weight corrected for vitamin losses in cooking and the weights of vegetables refer to cooked or raw weight depending on the form in which they were eaten.

Both history and physical examination were done by physicians with special training in nutrition, and, for children under 4 years, were done by a pediatrician. Special attention, naturally, was paid to the symptoms and signs of nutritional deficiencies, particularly to those of the early or mild deficiencies and to diet and habits of eating.

Definitions and descriptions of the details of the history and physical examination in respect to the individual nutritive factors will be given with the reports dealing with each factor. The present report deals with the energy principle (calories) and the features noted in the history and examination with respect to energy nutrition were as follows: In the *history*, a past tendency to overweight or underweight, a history of recent abnormal increases or decreases in weight, the number of meals eaten daily, the consumption of alcoholic beverages, and the general characteristic of the diet. In the *physical examination*, the state of subcutaneous tissue and musculature and, classed with either the physical examination or the *laboratory*, the height and weight.

The history of past obesity or leanness, recent changes in weight, and habits regarding meals and eating was obtained by the clinician at the time of the examination and the findings in these respects are an evaluation by him of the responses of the subject to his inquiry. The state of the musculature and subcutaneous tissue represents also the examiner's judgment and was based only on a rough quantitative or attempted quantitative measurement by simple inspection and palpation. It was felt, that in view of the unsuitability and unreliability of the objective quantitative measurements which have so far been devised for this purpose, equally satisfactory results would be obtained by taking the examiner's opinion to be based on a number of related observations, such as elasticity of the skin, constitutional type, age of the subject, etc.

Weight was measured on standard platform scales, without coat or shoes and recorded to the nearest quarter pound except for children under one year old. The latter subjects were weighed on a balance scale to the nearest quarter pound. The standards for

\* Copies of these tables are much too lengthy for publication with these reports. They can be furnished by special arrangement by writing to the authors, as may copies of record forms used.

weight used were those which allow for weight of clothes and although there was some variation with season this was not great.

Height was measured with a steel measuring rod attached to the scale, with the subject bareheaded, standing to attention and in stocking feet. It was recorded to the nearest quarter inch. Length rather than height was measured in young children. For standards of weight according to height, age and sex, the tables of Baldwin and Wood<sup>5</sup> have been used.

The method of obtaining the socioeconomic data and the classifications and definitions used in this part of the study require little comment. Dependent members of the household have been assigned to the income group of the household as have independent members. The latter had their own income determined separately, but in determining household income it has been included in the household income because it is the latter which determines the character of the dietary. It was considered that income of the individual member, if used in part to pay for board in the family merely served to increase the income level of the family unit as related to food supply. Income has been calculated to include only actual cash income. Additional income in the form of food has been considered separately under the heading of home food supply.

Relief status was ascertained by direct inquiry and by reference to official rolls if necessary. The number on relief was very small and included mainly those receiving old age pensions. When relief was given the amount, in cash or in kind, was indicated.

For the purpose of analysis the data obtained were coded and transferred to punch cards. In future studies the use of the code or a similar one will make it possible to analyze the data and secure the results of a survey in a very short time after the data have been collected.

## RESULTS \*

The inhabitants of the area at the beginning of the study numbered 1,272 individuals, included in 311 households. Of these, 26 households with 86 individuals refused entirely to cooperate in the study, leaving 1,186 individuals in 286 households who began the study. Of this number 34 individuals subsequently failed to complete their diet study, either because they refused to continue further, because they moved away, or were too ill to continue. Thus of a total of 1,272 inhabitants 1,152, or 91 per cent, completed the dietary part of the first period of the survey. At the first examination 58 individuals (50 white and 8 colored) failed to be examined and have the laboratory tests, for reasons listed above, leaving 1,094, or 85 per cent, of the total population who completed the study in the first period.<sup>†</sup> In addition 5 subjects were examined who did not complete the individual dietary study.

Over 90 per cent of the subjects had their *first* examination in the late summer and the fall, the remainder in the late winter and spring.

The distribution of the subjects according to age,<sup>‡</sup> sex, and race is shown in Table 1. The proportion of Negroes to whites is slightly higher than the average for the region which is approximately 25 per cent.

The distribution of white and colored households according to annual cash income is shown in Table 2. Among the whites there is a fairly equal distribution among the various income levels but among the Negroes few had an an-

\* The results of the first examination only are given here. Comparison of the results of the summer-fall and winter-spring examinations will be reported later.

† This total number does not apply to all the items of the examination. In some cases, as with young children, certain examinations were of necessity omitted and occasionally a determination or a part of the examination was missed.

‡ Determined to the nearest birthday except for those one year old and under whose age is determined to the nearest month.

TABLE 1

*Distribution of the Subjects According to Age, Sex, and Race*

Age	White		Colored		Total
	Male	Female	Male	Female	
Less than 3 months	2	0	5	3	10
3-6 months	3	2	2	1	8
7-11 "	2	2	2	1	7
1 year	4	5	3	6	18
2 years	8	10	7	6	31
3 "	4	10	8	4	26
4-6 years	26	22	11	13	72
7-9 "	35	31	21	5	92
10-12 "	26	25	17	14	82
13-15 "	21	19	15	15	70
16-19 "	30	27	15	22	94
20 "	10	6	7	2	25
21-29 "	46	56	29	25	156
30-39 "	64	66	20	23	173
40-49 "	42	41	15	16	114
50-59 "	41	40	15	15	111
60-69 "	22	16	11	11	60
70-79 "	11	7	4	4	26
80-89 "	2	3	4	1	10
90-99 "	0	0	0	1	1
Total	399	388	211	188	1,186

TABLE 2

*Distribution of Households According to Income*

Income Dollars	White		Colored	
	Number	Per cent	Number	Per cent
Less than 500	42	21.4	46	51.1
500-999	32	16.3	35	38.7
1,000-1,499	44	22.4	5	5.5
1,500-1,999	34	17.3	2	2.2
2,000+	40	20.4	00	0.0
Unknown	3	1.5	3	3.3
Total	195		91	

nual income over \$1,000. Over half had an income less than \$500. Only 6 colored households, composed of 26 individuals, and 1 white household of 2 persons, were "on relief." In 5 of the colored households the relief consisted of an old age pension, \$2 to \$10 per month. Its nature in the 6th is unknown. For the single white household direct relief was received in the form of \$2 weekly for groceries.

The "size" of the households, which may be an important factor in the nutrition of the members is shown in Table 2-a. Little difference is found between white and colored, though the latter households were slightly larger on the average.

TABLE 2A

*Size of Households\**

*White and Colored Households Listed According to the Number of Individuals Composing the Household*

Number of Individuals in Household	Number of Households	
	White	Colored
1	7	7
2	36	24
3	37	10
4	43	9
5	32	14
6	17	8
7	11	6
8	7	5
9	3	5
10	0	1
11	0	1
12	1	1

\* Because of a few instances of improper classifications of households for size, total subjects computed from this table differ slightly from the actual number.

TABLE 3  
*Relation of Home Food Supply to Variation in Cash Income*

<i>Income Group</i>	<i>Home Food Supply</i>				
<i>Dollars</i>	<i>None</i>	<i>Slight Amount</i>	<i>Moderate Amount</i>	<i>Large Amount</i>	<i>Total</i>
<i>No. of Subjects</i>					
<i>White</i>					
Less than 500	8	50	58	29	145
500- 999	14	29	45	45	133
1,000-1,499	3	20	58	77	158
1,500-1,999	28	27	52	46	153
More than 2,000	15	29	39	96	179
Total	68	155	232	293	748
<i>Colored</i>					
Less than 500	30	60	39	29	158
500- 999	34	80	24	41	179
1,000-1,499	6	17	12	0	35
1,500-1,999	0	3	0	12	15
More than 2,000	0	0	0	0	0
Total	70	160	75	82	387

The status of the households with regard to home food supply is shown in Table 3. Slight amount means a poor, seasonal garden, with or without a few chickens but no hogs, cows, or other livestock. Moderate amount includes one cow per household and a garden estimated to furnish about half a reasonable supply of vegetables. Large amount is anything over the latter. There is noted a tendency for the home food supply to increase with the increasing cash income, those with the highest cash income tending to have the best home food supply. Those most in need seem to have had the least. This tendency

was nearly lacking in the Negroes, perhaps because of the concentration of households in the two lowest income groups.

The status with respect to occupation is given in Table 4. Totals do not correspond to the total number of subjects because some have been listed under more than one occupation. School children form the largest group in both white and colored, with housewife and agricultural worker next in each group respectively. Percentages are very much the same in white and colored. However, in the other classifications a considerable difference between white and

TABLE 4  
*Distribution of Subjects According to Occupation\**

Occupation	White		Colored	
	Number	Per cent	Number	Per cent
Schoolchild	208	27.2	95	25.0
Housewife	193	25.3	93	24.5
Agricultural Worker	134	17.6	72	18.9
Preschool child	84	9.6	57	12.6
Manufacturing	48	6.3	10	2.6
Professional	33	4.3	2	0.5
None	23	3.0	17	4.5
Tradesman	20	2.6	4	1.1
Transportation	7	0.9	1	0.3
Other	36	5.1	42	11.0
Unknown	15	1.9	6	1.6
Total	801		399	

\* Totals do not correspond to total subjects because some subjects have been listed under two or more occupations.

TABLE 5

*Education Attained at Time of Examination*

Age	Less than 3rd Grade	3-5 Grade	6-8 Grade	9-10 Grade	11-12 Grade	Attended College	No Education	Un- known	Total
<i>White</i>									
1- 3	0	0	0	0	0	0	31	10	41
4- 6	5	0	0	0	0	0	34	9	48
7- 9	32	26	0	0	0	0	1	7	66
10-12	3	23	14	0	0	0	1	5	51
13-15	0	4	20	12	0	0	0	4	40
16-20	0	3	14	15	24	7	0	10	73
21+ (Men)	5	23	67	16	55	14	6	42	228
21+ (Women)	4	18	52	25	68	30	2	30	229
Total	49	102	167	68	147	51	75	101	776
<i>Colored</i>									
1- 3	0	0	0	0	0	0	34	0	34
4- 6	8	1	0	0	0	0	14	1	24
7- 9	19	5	0	0	0	0	0	2	26
10-12	4	22	4	0	0	0	0	1	31
13-15	0	9	18	1	0	0	0	2	30
16-20	0	4	37	3	0	0	0	2	46
21+ (Men)	8	34	28	3	1	0	18	6	98
21+ (Women)	4	36	39	5	0	1	3	8	96
Total	43	111	126	12	1	1	69	20	385

colored is found, with relatively much smaller numbers of colored in manufacturing, professional, and tradesman classifications and more in the varied occupations classified as "other," house servants for example. There is slightly greater percentage of colored with "no occupation." The larger percentage of preschool children among the Negroes probably reflects the later age of starting school.

The educational status of the subjects is given in Table 5. The table is somewhat obscure because there is no clear indication in the table whether schooling is continuing or not, and in certain age groups the education stated may not be the final amount expected. A finding of interest is that among the Negroes the accomplishment, in the sense of attendance, up through the 6th-8th grade is

the same as for the whites. In fact, the percentage is somewhat greater, 40 and 36 per cent. The break at this point coincides with the lack of facilities beyond this educational level. The nearest high school for Negroes was at Nashville, about 15 miles away. Thus, as far as the opportunity was available, the education of the Negroes seems equal to that of the whites in grades attended.

NOTE: The second section of this paper will appear in this *Journal* at an early date.

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# Effect of Prolonged Storage on the Antigenicity of Chloroform-Inactivated Canine Rabies Vaccine\*

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IN the course of previous tests of the antigenicity of chloroform-inactivated canine rabies vaccine it was clearly demonstrated that a single 5 ml. dose, administered subcutaneously, afforded dogs a high degree of resistance to experimental intramuscular inoculation of rabies street virus.<sup>1</sup>

Having thus obtained evidence that dogs can be immunized with rabies vaccine containing no demonstrable virus it was considered important to determine the effect of prolonged storage at refrigerator temperature (5° C.) on the antigenicity of this product. A large volume of one lot of chloroform-inactivated vaccine was obtained from a commercial source and stored at this laboratory. This was first tested in dogs 4.5 months from the date the vaccine was prepared. The same vaccine was again tested after 6 and 12 months' further storage.

## MATERIALS AND METHODS

The dogs used in the three experiments had not been previously vaccinated and were purchased directly from the owners. In each of the three tests the dogs were so allotted that the average age and weight of the vacci-

nated and control groups were, as near as possible, the same. The majority of the dogs were between 1 and 2 years of age. In order to satisfy statistical requirements, at least 30 dogs were included in each vaccinated and control group.

The chloroform-inactivated vaccine was of ovine origin and contained 33⅓ per cent of brain material. The vaccine was produced November 13, 1940. The safety test was completed at the commercial laboratory January 27, 1941, and no live virus was demonstrated. Further tests at this laboratory likewise proved negative. The first group of dogs was vaccinated March 31, 1941, the second group, October 1, 1941, and the last group April 3, 1942. All vaccinated dogs were given a single 5 ml. dose, 2.5 ml. being injected subcutaneously on either side of the cervical spine.

The vaccinated dogs were inoculated with rabies virus 30 days after vaccination in parallel with like groups of control animals. The test virus was obtained from the brains of dogs dying of rabies after natural exposure. This brain material had been stored in pure glycerin in an ice cream hardening cabinet at, —25° C. At the time of each challenge virus test an entire brain was weighed and after thorough trituration was diluted 1:10 by weight in dis-

\* The studies and observations herein reported were conducted with the support and under the auspices of the International Health Division of The Rockefeller Foundation and the Alabama State Board of Health.



tilled water. The supernatant fluid after centrifugation was used as the street virus inoculum.

An injection of 0.5 ml. of the virus suspension was given into each masseter muscle of all vaccinated and control dogs. The animals were subsequently observed for a period of at least 90 days. Autopsies were performed on all dogs dying during the 90 day observation period. The brains were examined for Negri bodies and if this examination was negative, 0.03 ml. of a 10 per cent suspension of a pool of various portions of the brain was inoculated intracerebrally into each of four white mice.

#### EXPERIMENTAL RESULTS

The results of the three tests of the antigenicity of one lot of chloroform-inactivated rabies vaccine are set forth in Table 1. In test number one, 2 vaccinated dogs died of causes other than rabies during the 90 day period of observation. There were no incidental deaths in the control group. Two of the remaining 32 vaccinated dogs died of rabies (6 per cent), while 20 of the 36 control dogs died of the disease (56 per cent).

and 1 control dog died of incidental disease during the experiment. Six of the 40 remaining vaccinated dogs died of rabies (15 per cent) compared with 25 rabies deaths in the group of 39 control dogs (64 per cent).

#### DISCUSSION

It is evident from the results obtained in the three tests that in each instance a high degree of protection was afforded the vaccinated dogs by a single injection of vaccine. In view of the inability to demonstrate live virus in the chloroformized vaccine by animal inoculation it is unlikely that the persistent antigenicity of this product can be explained by the presence of minimal amounts of live virus.

Although there is suggestive evidence that the antigenicity of the product was slightly reduced by prolonged storage, the difference in the results obtained in the first and third tests could be explained by chance alone. The lower mortality among vaccinated dogs in test one as compared with test three was accompanied by a proportional difference in the mortality of the two control groups. A statistical study of the

TABLE 1

*Three Tests of the Antigenicity of One Lot of Commercial Chloroform-Inactivated Canine Rabies Vaccine*

Test	Age of Vaccine	Vaccinated Dogs			Control Dogs			* Statistical Significance
		Number of Dogs	Died of Rabies	Per cent Dead of Rabies	Number of Dogs	Died of Rabies	Per cent Dead of Rabies	
I	4.5 months	32	2	6	36	20	56	0.0000
II	10.5 months	33	4	11	41	27	66	0.0000
III	16.5 months	40	6	15	39	25	64	0.0000

\* By corrected  $\chi^2$  test. Likelihood of getting a difference as great or greater than that observed in the mortality of the vaccinated and the control groups by chance alone.

In test number two, 2 vaccinated dogs and 1 control dog died of causes other than rabies during the 90 day observation period. Four of the 38 remaining vaccinated dogs died of rabies (11 per cent) while 27 of 41 control dogs succumbed to the disease (66 per cent).

In test number three, 1 vaccinated

three tests shows that in each instance the difference in the mortality of vaccinated and control dogs was highly significant.

The present regulations governing the marketing of canine rabies vaccine require that the date of preparation of the vaccine be noted on the product and

that the expiration date be given as one year from the date of preparation. It is evident from the results obtained in this study that the antigenicity of chloroform-treated rabies vaccine, if stored at refrigerator temperature, is well maintained for one year after production.

#### SUMMARY

A single lot number of commercial chloroform-inactivated canine rabies vaccine was tested in dogs 4.5, 10.5, and 16.5 months after preparation. In each test the vaccinated dogs were given a single 5 ml. subcutaneous dose of vaccine. The vaccinated dogs were inocu-

lated intramuscularly with rabies street virus one month after the day of vaccination in parallel with like groups of control dogs. At least 30 vaccinated and 30 control dogs were used in each test. In each test the vaccinated dogs developed a highly significant degree of resistance to experimental inoculation.

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NOTE: The statistical analysis of the experimental results was made by Leonard V. Phelps of the Department of Vital Statistics, Alabama State Board of Health.

## Highlights of the 71st Annual Meeting

A STENOGRAPHIC report, with very little editing, is presented herewith of the Fifth General Session of the St. Louis Annual Meeting of the American Public Health Association held in the Convention Auditorium, November 30, 1942, as the final session in the meeting. This was an informal panel discussion under the auspices of the Editorial Staff of the AMERICAN JOURNAL OF PUBLIC HEALTH. Participants included Harry S. Mustard, M.D., JOURNAL Editor, Director of the DeLamar Institute of Public Health, Columbia University, New York; Leona Baumgartner, M.D., Director of the Bureau of Child Hygiene, New York City Department of Health; Martin Frobisher, Jr., D.Sc., of the School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md.; Roy J. Morton, C.E., Vanderbilt University School of Medicine, Nashville, Tenn. (substituting for Arthur P. Miller, C.E., U. S. Public Health Service, New York, N. Y.); and James E. Perkins, M.D., Director, Division of Communicable Diseases, New York State Department of Health, Albany. The presiding officer was Reginald M. Atwater, M.D., Managing Editor, AMERICAN JOURNAL OF PUBLIC HEALTH, and Executive Secretary, American Public Health Association, New York.

THE CHAIRMAN: It is only natural that the emphasis so far in these meetings has been on the individual scientific sessions and on the specialties we have, as distinguished from those things which we have in common as public health workers. Here today we are bringing you an over-all view which we hope will give you some orientation on our common interests in public health. It has been thought well that the Annual Meeting should end on this comprehensive note.

It is also intended that you should see something of the way in which the editorial staff of the AMERICAN JOURNAL OF PUBLIC HEALTH approaches the matter of selecting the content of the twelve issues of the JOURNAL. We hope that the participants will hereafter be more to you than names on the JOURNAL masthead.

Let me say at the outset that it is not intended for this session to be entirely inclusive of all the highlights of the Annual Meeting. The content of the last seven days has been far too inclusive for that to be possible. Never-

theless, we shall try to make the best use of this opportunity to interpret some of the scientific sessions to those who could not attend because of other preoccupations.

The Association itself has taken some important actions in St. Louis. Steps are under way to create a new section on school health and a committee has been authorized to be charged with the job of implementing action in the whole area of school health policies and projects. Action was also taken this year to establish provisionally a section on dental health. By the time of the next Annual Meeting it seems likely that both of these sections will be ready for formal establishment, thus raising the number of sections from ten to twelve.

But now for the highlights of the program itself. Dr. Mustard, will you comment on the broad significance in Dr. Parran's address at the First General Session on Dynamic Public Health in Global War?

DR. MUSTARD: There were two things that I brought away with me from Dr. Parran's discussion which related to a

trip he recently took into Mexico and South America. One of the things which he emphasized is that South and Central America and Mexico have something to teach us. We have gone hitherto upon the more or less comfortable and perhaps not entirely justifiable assumption that the flow of knowledge and the flow of health must all be from North America southward.

I had the opportunity sometime ago to visit the Caribbean and the Central America areas as well as the northern part of South America. I was amazed there at the enthusiasm, the vigor, the ingenuity with which these people have attacked their problems. They have developed devices and procedures in malaria control, for instance, for which they need apologize to no section in the world for thoroughness of coverage and for basic scientific approach to the problem.

One other point that I should like to emphasize from Dr. Parran's talk—and this is one of which we are all more or less conscious—is that the interchange of people and goods and opinion from now on with these countries is going to be multiplied a hundredfold. When we think of the length of time that it once took, for instance, to get into some of the portions of South America as compared with the comparatively short airplane flights today, I think we can understand that there is going to be an intercontinental life and concern between the two continents that we have never approached before.

CHAIRMAN: Dr. Baumgartner, you attended the wind-up session of the Health Education Institute. Will you give us the highlights of that final session?

DR. BAUMGARTNER: I think I might say that it warmed all the cockles of an editorial heart to hear the final wind-up speech by Dr. Winslow, because it was put in those golden words in which Dr. Winslow can so well sum-

marize a session. He summarized two full days which included the most active audience participation there has been in any Health Institute program, and he summarized those days which had been spent in talking about community organization by drawing an analogy with a political election. He said that, as far as he could discover, a political election was not won by the parades and the posters, but it was won by the ward heeler and the ward boss who went around and got the votes, and that community organization and health education were not accomplished by posters and handbills, but were achieved by sound community organization.

He made the point that the job ahead of us is going to be a more difficult one than the job behind us, because the old motivations of fear of the spread of contagious diseases, for example, were gone, and that in the job ahead of us in making a democracy work, there was going to be a great difference as to whether or not we *educate* the people or whether we *train* them. He pointed out that probably both education and training were necessary. He pointed out that you could *train* a plant, but you had to *educate* a man. In training people, you could teach them automatically to respond to external stimuli; but if you wanted imagination and creative leadership, you really had to *educate* people. I am sure we will all want to study more carefully that differentiation between education and training, which Dr. Winslow made.

CHAIRMAN: Mr. Morton, will you give us a little insight into the sessions of the Conference of State Sanitary Engineers?

MR. MORTON: As you know, the Conference of State Sanitary Engineers is an advance meeting, but it is traditional that that organization meet with the American Public Health Association. For a good many years the Conference of State Sanitary Engineers has had, as

full members of the Conference, only the chief engineers of the several states and territories and representatives of the U. S. Public Health Service. This time, the meetings were attended by more than a score of sanitary engineering representatives from the Central and South American countries. They were asked and urged to participate and did participate, apparently enjoyably and apparently with mutual profit.

The most significant result was that action was begun by which each of the Central and South American countries will be invited to have a full member of the Conference of Sanitary Engineers, thus furthering in a significant way our hemisphere solidarity.

CHAIRMAN: Dr. Mustard, do you think we can use in the JOURNAL that very generous resolution that the South Americans presented last evening at the banquet session?

DR. MUSTARD: I think that it would be unwise to make a point-blank answer at this time. However, that gives me an opportunity to say something that I have long wanted to say: The material as published in the JOURNAL is not always chosen on the basis of its absolute worth, but rather largely on the basis of its relative worth.

We turn down about two and a half papers for every one that we accept. Consequently, the question of whether or not we could find a place for those resolutions in the JOURNAL would to some extent be a matter of space. However, other factors would influence it, in that we do believe that one of our great opportunities, as I have just said, is that of developing better relationships with South and Central America.

These Latin Americans are, incidentally, the most courteous people in the world, and things that we may sometimes overlook or perhaps not pay a great deal of attention to, are matters of considerable importance to them.

And so I should think we ought to give very careful consideration to the publication of these resolutions.

I should like to say one thing more about the JOURNAL, I am very anxious to get papers, to have papers come in from some of the younger people in the Association. There are certain names, including my own, that I have seen so often in print that I am weary of them, and I should like to see some new blood come pumping and pulsing through in terms of papers. Now, I am not going to promise you that just because you are young, you are going to have your paper accepted, but I can promise you that merely because you are not in the "stuffed shirt" group, there is no reason why your papers will be turned down, and I should welcome contributions from some of the younger members of the Association.

CHAIRMAN: Dr. Perkins, some of us did not get around to all of the meetings that we wanted most to attend; and I must confess that one of the papers that I was particularly interested to hear was that by Dr. Robertson of Chicago on germicidal vapors as a means of disinfecting air. Please give us a summary of what he said.

DR. PERKINS: Dr. Robertson reported further on his experiments with propylene glycol. For those of you who are not familiar with his previous experiments, this hygroscopic material, when sprayed into the air, has the capacity to kill microorganisms in the air; so you can see its possibilities in the future control of air-borne infection. As the effect is instantaneous, it seems clear that this aerosol performs its work in the vapor stage rather than in the droplet form.

The most interesting aspect of Dr. Robertson's paper at this meeting, to me at any rate, was a further report on his studies of toxicity. The question which immediately comes to mind is

what is the effect of these vapors on man? Propylene glycol has been given orally and intravenously to human beings without toxic reactions. Nevertheless, Dr. Robertson has hesitated to subject human beings to breathing the gas until it has been adequately tried on animals. He has some rats which have now been subjected continuously to this vapor for fifteen months without any apparent ill effect. He has also tried it on monkeys, a step closer to the human being, and they have been subjected to this vapor continuously for a period of four months; also apparently without any ill effect.

CHAIRMAN: Dr. E. R. A. Merewether of the British Ministry of Labor is here—Dr. Merewether, does that relate to anything that has been done in England in connection with attempts to control respiratory infections?

DR. MEREWETHER: Yes, it does. As you may know, the Medical Research Council has experimented with various solutions for disease-infected atmospheres, mainly in connection, of course, with shelters during the blitz winter, and the one they have been using mostly has been an ordinary hypochlorite solution. That, of course, is not suitable for a room like this one, because, as you will agree, it would bleach the curtains, for instance, but it is very suitable and cheap for vast numbers of shelters which have been occupied during the night and require disinfecting before being occupied again the following night.

With regard to factories, various experiments have been made using cheap oil on the floors, and these have been found to reduce the percentage of hemolytic streptococci and organisms of that class.

I would say that we in England have not progressed very far, and I am deeply interested in this paper, which unfortunately I could not hear because it was out of my session, and I am hoping to be able to read it in the published

proceedings. There is no doubt that as the war progresses and transfer of populations takes place, even on the small scale that has happened in my country, this question of the transfer of respiratory infections is of supreme importance. In that connection, we have had an increase of cerebrospinal meningitis in my country, and we also have thought of separating people in canteens, in factories, etc., by cellulose acetate screens and the like. But, as I say, we have not progressed very much further than thinking and experimentation, except with the disinfection of shelters.

CHAIRMAN: One of the features of this meeting has been the accessibility of Dr. Merewether, Dr. William Frazer, of Liverpool, and Sir John Orr, who have added much to our interest.

I wonder if Professor Winslow, with his broad experience in the field of ventilation and industrial hygiene, has any comment to make on the present status of this effort to disinfect the atmosphere, especially as it may be used in conjunction with the ultra-violet light method.

PROFESSOR WINSLOW: I have just finished an attempt to review the history of epidemiological thinking, the last chapter of which deals with Chapin's modes of infection, and I have come to the conclusion, in writing that chapter, that the one new principle that has altered our conceptions of epidemiology since 1910 was this discovery of the wider range of atmospheric transmission. I think the evidence is sufficient to show that under appropriate circumstances the control of this type of infection is desirable, and that it can be accomplished either by the use of ultra-violet radiation or by the use of aerosols. I do not think we know the relative advantages of each under various conditions, but we have two good methods of dealing with atmospheric infection.

CHAIRMAN: Mr. Barron, you were

Chairman of the Engineering Section where you had a paper on the subject of ultra-violet light.

MR. BARRON: Yes. Professor Wells, of the University of Pennsylvania, presented a very interesting paper regarding his observations of the incidence of measles, I believe, and some other communicable diseases under conditions where in one part of several schools, irradiated air had been used and in other parts ordinary ventilation had been used, with quite remarkable differences in the incidence of communicable disease.

CHAIRMAN: You are going to see much more about this in the pages of the AMERICAN JOURNAL OF PUBLIC HEALTH.

Dr. Frobisher, tell us what is new in the field of syphilis serology at this Annual Meeting.

DR. FROBISHER: I sat in on a rather interesting discussion of new methods of the use of the test in syphilis serology, a screening device to eliminate excessive amounts of work in the laboratory, and a study of the verification test. These papers were commented upon by Dr. Kahn of Michigan and his coworkers; Mr. Webb of Georgia read one of these papers. The details of the technic will probably appear in the JOURNAL, so that I think we need not go into that particularly.

I was interested in the argument that arose regarding the reporting of the results of laboratory tests. It seems that many laboratories run several tests: they may run the Kahn test, the Eagle test, the Hinton test, and maybe two or three others, and those tests do not always agree; the physician is sometimes left to find out and to decide for himself whether the patient has syphilis or not. He is often at a loss, and he calls up the laboratory and says: "What do you think? Is this a case of syphilis or isn't it?" And the question came up as to whether the laboratory had a proper

function to summarize and average up the results, all the 4-pluses and 3-pluses and plus-one-and-a-half, and turn out an average result and say: "That is the result . . . we think the patient has syphilis."

I do not think the difficulty was settled while I was there, but it brings up the whole question of laboratory reporting.

The same problem has arisen in connection with reports on typhoid serology, the H and O and Vi agglutination test, and the various titers that are reported, and whether the laboratorian should summarize his report for the physician or leave the physician to wade through it and look up the literature and decide for himself what the report means.

I think it is an open question. There are two decided schools of thought on the matter, and perhaps we might hear an opinion or two before we get through, because apparently the feeling is quite distinct. There was no settlement of the question while I was present, but I think it is a very live one that has to be settled eventually.

CHAIRMAN: Dr. Baumgartner, will you give us a brief resumé of what happened in the round tables of the Maternal and Child Health Section, where various kinds of pediatric problems came up?

DR. BAUMGARTNER: The chief problem that came up in the round table I attended was the establishment and maintenance of a normal appetite in terms of nutrition. It was interesting that, instead of talking about how to cure babies or school children of not eating properly, the whole emphasis was put on the basis of how to prevent them getting that way at all. I think probably the discussions could be summed up most aptly by saying all the experts who were there thought the baby was more important than the clock. They did not think it was very important any more to be sure the baby was fed a

given number of calories at a given time. They pooh-pooched the idea that the baby was nothing but a calorimeter.

They seemed to think that parents and pediatricians and nurses had gone around not paying much attention to the personality of a baby, paying no attention to his normal appetite, and, probably as a result of many of their admonitions, have just ruined what might normally be a perfectly good appetite in a small child. They pointed out that a baby ought to like to eat, that mealtime should be a pleasing time instead of a battleground or disciplinary period. They pointed out that most children's eating problems came about by mothers being worried that they did not eat. They gave practical hints.

Most pediatricians know well that a child of two does not eat as much as a child of one, but it is hard to convince a mother of this fact. Dr. Casparis says he handles it this way: He says to a mother of a child: "He has tripled his weight in one year, he weighs thirty pounds. Would you like to have him weigh ninety pounds next year?" Then she shudders.

The session was full of practical hints, though I am not sure we can get the participants to write them down so we can get them in the JOURNAL. It is a new approach and, inasmuch as public health people are responsible for the feeding habits of a large number of children, it seems to me important for us to know this new point of view in the field of pediatrics.

CHAIRMAN: Dr. Baumgartner, would you say we had a device here in terms of these round tables that we ought to use again? I understand this device has been used by the Academy of Pediatrics. Do you think it suits our needs?

DR. BAUMGARTNER: It certainly suited our needs in the session I attended. How was it in your section, Dr. Deitrick?

DR. DEITRICK: We had to cancel one

round table of our three because the leader was called to Washington. Both round tables were considered very satisfactory.

CHAIRMAN: The Program Committee is going to consider that idea of the further use of round tables. Was the number in attendance limited, Dr. Deitrick?

DR. DEITRICK: Yes, it was. We tried to limit it to forty-five, but fifty-two crept in to one of the sessions.

CHAIRMAN: Dr. Perkins, what happened in that paper I hear so much about in the Epidemiology Section on this matter of water supplies and infantile paralysis?

DR. PERKINS: Dr. Kenneth F. Maxcy of Johns Hopkins University presented his paper in such a scholarly manner that I hesitate very much to attempt to interpret it and summarize it for you.

Dr. Maxcy first pointed out that certain data, which for the most part have been accumulated in recent years and are largely of a laboratory nature, are apparently consistent with the possibility of poliomyelitis being transmitted through water supplies. Some of these data are the finding of poliomyelitis virus in the stools of cases, contacts of cases, of other individuals in the community; and the isolation of the virus from sewage coming from hospitals in which there had been poliomyelitis cases, and even sewage draining certain communities in which poliomyelitis cases had occurred.

Then he pointed out that certain strains of the virus apparently are resistant to chlorination in the doses ordinarily used in the treatment of water supplies. He further stated that, although it had not been published as yet, a manuscript had come to his attention which seemed to indicate that the virus could survive passing through purification processes ordinarily used in the treatment of water supplies.

He then went on to say that, in spite



of these data which are consistent with that possibility, the pattern of spread of poliomyelitis in nature does not suggest that it is usually spread through water supplies. He substantiated his statement by various points, such as that there had not appeared in the literature a report of a large outbreak having the well known characteristics of a water-borne outbreak. He stated that usually there is a predilection for rural areas rather than city areas; that even here it spreads out in a radial manner and apparently is not influenced by the local water supplies involved.

He also pointed out that, even though perhaps occasionally it might be spread via water, this would not justify classification as a water-borne disease, and gave as examples tularemia in Russia and Turkey, which has occurred there as a water-borne disease, though ordinarily it is not so considered. The brucellosis outbreak in East Lansing, Mich., and the amebic dysentery outbreak in Chicago, were also cited as unusual instances of water-borne transmission of diseases not ordinarily transmitted in this manner.

CHAIRMAN: You may recall that the definitive article describing the outbreak of brucellosis in East Lansing appeared in the *AMERICAN JOURNAL OF PUBLIC HEALTH*. Dr. Perkins, does Dr. Maxcy's conclusion check with your experience in New York State?

DR. PERKINS: Yes, and with our experience in Minnesota.

CHAIRMAN: Mr. Morton, you had a paper on "The Epidemiological Basis of Environmental Sanitation." Please tell us about that.

MR. MORTON: In a symposium, Dr. Gaylord Anderson presented a paper on "The Epidemiological Basis of Environmental Sanitation." In this paper he showed by example that some procedures of environmental sanitation cannot be justified on an epidemiological basis. He therefore made a plea for better

analysis of the program, and especially when faced with any reduction of service available he recommended that the selection of things to be done should relate to their epidemiological or direct public health value.

He did not advocate throwing over all esthetic values. He said that, if esthetic values can be maintained without sacrificing something which by the analytical approach which he recommended had been found more valuable, they should be maintained. In other words, if you can retain the most valuable things and still have some of the values left that are desirable because they are decent, he did not object. It was a very useful, a very interesting, and stimulating paper in urging a more thoughtful approach to environmental sanitation.

CHAIRMAN: Mr. Thomas Stowell of the New York State Department of Health, who has been in charge of the motion picture theater here has just come in. Mr. Stowell, what were the highlights of the motion picture exhibits? What new things have you seen there? Don't be afraid to include some of your own New York State films that are good.

MR. STOWELL: This year again we have found an unusual interest and a hunger and thirst for nutritional films, good nutritional films; and in that connection we found a great deal of interest in a new film produced by the St. Louis Dairy Council on "Making Ends Meet," and in "Hidden Hunger," the national nutritional film. It was quite interesting that two of the most popular films that we exhibited were Canadian films, one from the Saskatchewan Cancer Commission, a new cancer film, "That They May Live," and another "Food, Weapon of Conquest," produced by the National Film Board.

There was interest also in "Local Health Problems in War Project Areas," which illustrates problems arising in New York State when a large war proj-

ect entered a very small community. Another film, "The Ominous Arms Case," on back siphonage gotten out by the plumbing industry, created a great deal of comment.

One other thing I think was quite noticeable this year: an interest and a demand for dental hygiene films, which was partially met by a new film from the American Dental Association, called: "Our Teeth." As to scientific films, we had one session on films designed for professional audiences only, and of the sessions we had, I think that it had the lowest attendance, so I am wondering whether that is really worth while.

CHAIRMAN: Mr. Stowell, is the silent film entirely out of the picture now for health departments and voluntary agencies, or is there some use still for the silent film?

MR. STOWELL: I should say there is still a great use for the silent film, especially in more or less technical subjects; especially the silent film for organizations that want to produce their own films, and I think that is to be very much encouraged, too. We had a film from San Jose, Calif., on "Home Nursing"; they tell me that they felt the definite lack of a good home nursing film, so they made one. Although it has technical disadvantages, I think, it still is not a bad job at all; that was made silent and will serve a very definite purpose.

CHAIRMAN: Is color a necessity in films of that sort?

MR. STOWELL: Not at all. Color is advisable in films that you expect to show to lay audiences, of course, especially from the West. I understand they do not like to look at pictures around California unless they are colored, but in the East we do not find that difficulty.

CHAIRMAN: You of the audience must not expect us here in this review, of course, to be exhaustive; we have no intention of taking up every important paper here, and if we give dispropor-

tionate emphasis to one subject, please remember that we will hope to balance that emphasis through the JOURNAL and in other ways.

While we have Dr. Haralson here, the Territorial Health Officer of Hawaii, who is facing tropical diseases, if Dr. Frobisher will tell us what new light on tropical diseases came out in this meeting, then we will get Dr. Haralson to comment and perhaps include some other angles which the emergency in Honolulu has brought to his attention. Dr. Frobisher, will you open the subject?

DR. FROBISHER: Yes. The first mention of it that I heard was a talk by Dr. Hitchens, who regretted the lack of good general training in tropical disease, in men coming into the medical corps in the Army, and hoped that it might become more extensive.

The point was brought out also that there was a real possibility of the tropical diseases becoming ectotropical, so to speak, on the return of troops from tropical regions where these so-called exotic diseases exist. The question comes up, for example: when is a tropical disease not a tropical disease? It may not be a tropical disease when some of these people return from infected regions.

In discussing this matter with the other members of the editorial staff, the point was made that these men may bring back these tropical diseases, but they do not bring back with them the vectors, so that the danger is perhaps not so great. A man bringing a transmissible disease into an area where there is a related insect vector is a considerable menace, but the mere return of a man from the tropics to some northern area is not necessarily a menace.

CHAIRMAN: Dr. Mustard, which of the so-called tropical diseases do you regard as really important as you select papers for the JOURNAL?

DR. MUSTARD: In our JOURNAL we do not cover the more, shall we say,

exotic tropical diseases. We recognize that, with returning troops, opening up of commerce, etc., we may have flares of these rare diseases in this country, but for the great mass of public health workers and, I think actually for the people who are going with the armed services into the tropics, we of the JOURNAL are concerned primarily with giving information about two diseases. One of those is malaria, and the other is dysentery, and I think if the average individual can get himself thoroughly steeped in such knowledge as is available on the causes, control, and treatment of malaria and dysentery, he will have broken the back of that problem. If he does not, it will break his back. It is those two diseases that we should be principally interested in, but not necessarily exclusively, in connection with tropical diseases.

CHAIRMAN: Thank you, Dr. Mustard. Now, Dr. Haralson, how does this whole subject come to bear on your whole problem in Hawaii?

DR. HARALSON: Well, in the Territory of Hawaii, fortunately, so far as malaria is concerned, we do not have the vector; we do not have the *Anopheles* mosquito. It is a subject of very great concern, however, because we have no idea as to why we do not have the vector. Undoubtedly, *Anopheles* mosquitoes have been brought there in times gone by, but for some reason they no longer breed, or did not breed, in the Territory. I can theorize on the subject, but I have no answer.

We have had for a number of years an occasional case of malaria reported. We usually are able to trace that patient back to some outside malarial area. Since we have a larger concentration of troops out there at the present time than we have had in recent years, to say the least, we have had a number of cases of malaria, but they have all occurred, however, in troops from the mainland, and military authorities are

taking every possible precaution because, of course, we might get an *Anopheles* mosquito.

We do have the vector for yellow fever, but through good fortune, or good work on the part of the Quarantine Service, we have not had any yellow fever.

CHAIRMAN: How about dengue?

DR. HARALSON: We have not had any dengue for a long time, but we do have the vector. I do not know whether dengue is present in the Islands of the Southwest Pacific; I believe it is in the Philippines. Some twenty-odd years ago, I understand, we had a severe epidemic of dengue. So, for those principal diseases, we are just living in hopes and passing the ammunition.

We do have a couple of conditions that worry us. We have typhus fever and we have bubonic plague. Last year, we reported more cases of typhus than we ever reported before. Some of us question whether there has been an increase in number of patients or whether we are getting better reporting; we think we are getting better reporting.

It is the rat-borne variety and, of course, the eradication of that is theoretically simple: just eradicate the rat, and we will control it. I have been told since I came to the mainland on this short trip, that we had to get down to business and eradicate the rat. So, I issued cordial invitations to these experts and asked them to come out and lend a little assistance. You, friends on the mainland, have a cordial invitation to come out and give us some assistance, where rats breed out in the open and in the canefields, and there are plenty of tropical fruits and foods of all varieties to allow them to propagate in numbers.

So far as dysentery is concerned, in some areas some of us have no particular fear. Of course, from the military standpoint, this is one of the most disturbing possibilities. And since we have troops fairly well scattered over the

area of the Territory, the water supply and sewage disposal is, of course, a subject of considerable moment. There has been very close coöperation between the military authorities and our own local health departments and water boards, in doing everything possible to provide safe supplies. In spite of this, however, we know that we have so many supplies that are not properly protected that we do have fears. Fortunately, up to the present time, we have certainly had no outbreak of widespread importance.

CHAIRMAN: Thank you, Dr. Haralson. The JOURNAL recently has brought you word from the front line in Hawaii and in Alaska. We carried a paper by Dr. Courtney Smith on the work that is being done in the Territory of Alaska. We will try to keep alert on things that are happening on the firing line.

Dr. Haralson, as you go back to Hawaii, you carry our greetings with you, and we hope the news from there is going to continue to be good. Dr. Haralson has the only unit under the American flag where compulsory vaccination against smallpox and against typhoid fever has been uniformly enforced. Is that correct?

DR. HARALSON: I do not know whether that is correct. We did have enforced vaccination under military order, which was not as serious as it sounded, but I think if we, throughout the country, could get the people to appreciate the necessity of compliance with our own regulations as easily as we apparently did out there in connection with the military regulation, there would be no difficulty whatsoever in getting this very desirable result accomplished.

As a matter of fact, we had no sections or groups who objected. We know practically all of those whom we vaccinated because shortly before the vaccination was done, the entire population had been enumerated and registered and had been given identification cards—I

carry my own—and when they appeared for vaccination, a record was made. When we checked up and they had not appeared, we simply sent a message by a neighbor or friend. But, had it not been for that order, which at the present time they accept without question, that is, military order, we would probably have had the same difficulties and troubles that most of us experienced in times gone by. We claim something like ninety-five per cent against those two diseases and a considerable number against diphtheria, which was not required.

CHAIRMAN: Thank you, Dr. Haralson. Our best wishes go with you.

CHAIRMAN: We got away from the subject of tropical disease a moment before we intended. I would like to ask Dr. Henry Meleney, a member of the editorial board of our JOURNAL, whether in his specialty of tropical medicine he can throw any light on what we have learned here.

DR. MELENEY: I cannot add anything out of the meeting here today, but at a meeting of the Association of American Medical Colleges earlier in the week, approval was given to a plan for subsidizing staff members of the medical schools, who need further training in tropical medicine and parasitology, in order to conduct satisfactory instruction in their schools, and to provide for their attendance at special courses for this purpose within the next year; and I hope that will improve the teaching in the medical schools.

Dr. Mustard, will you say a word on the studies of local health units and the extent to which these seem desirable?

DR. MUSTARD: I should be very happy to talk about that, but I happened to see Dr. Haven Emerson in the audience. He is chairman of this subcommittee of the Committee on Administrative Practice, immediately concerned with that problem of nation-wide service and how it must be handled. I

should beg you direct your question to Dr. Haven Emerson.

(In the absence of Dr. Emerson, Dr. Mustard continued.)

DR. MUSTARD: I think there has been an increasing interest among public health workers not only in the amount of territory in the United States which is provided with reasonably adequate service, but there has arisen this new interest in what is to be done and how it is to be done in those still rather vast areas where the public health service is little better than it was a hundred years ago. And it is with the idea of studying geography, of studying square mile areas, of studying state laws, of studying budgets available, population concentrations, etc., that this committee, of which Dr. Emerson is Chairman, has been put to work.

Many of you, I am sure, saw the large folder which they had in an exhibit here with existing and proposed districts for the various states. I am sure that one who comes from any individual state and looks at those districts would be unlikely to agree that those particular red lines are the ones which should divide the state up into administrative districts or areas. And yet, even if we can start an argument and continue the thinking and action, I believe this committee of Dr. Emerson's will be, shall we say, the catalyst which will bring about finally this nation-wide service.

I think there is no doubt we have lagged somewhat and forgotten the people who were not served, being too much concerned with what we have already done. A reflection of that interest was to be found in a discussion the other day at this meeting, the debate on what type of health unit should be used in the United States.

CHAIRMAN: Thank you, Dr. Mustard. Some of us think there is significance in these units as they may help us to forecast the number of people who will be necessary for staffing adequately the

units across the country. You will remember that the Association passed a resolution, yesterday, saying in effect that we felt that all areas of this country should have adequate, full-time local health service. That is similar to a very significant resolution passed by the American Medical Association at its meeting in June.

CHAIRMAN: Dr. Louis I. Dublin is Chairman of a Committee on the Study of Voluntary Health Agencies, which reported this morning. I wonder whether Dr. Dublin would give us in a capsule the significant developments in that field.

DR. DUBLIN: Mr. Chairman, the first meeting under the auspices of the American Public Health Association of anything that looks like a study in the voluntary health field took place this morning. We had an hour, we had four speakers, there was an audience of perhaps 300, who seemed to be thoroughly interested in what was presented. The important point that was made was this: here is a vast field of health work which has heretofore received no concerted study; the field has grown up like Topsy; it represents a thoroughly American movement. If it could be summed up altogether, it might amount in terms of dollars to as much as was spent for official health work in the United States; in terms of time and effort, it would undoubtedly go way beyond the amount of health work done by official agencies. In terms of effectiveness—well, who knows? But here it is, a great big movement, spontaneous, full of human interest, involving the good will of millions of people, and a great big question mark as to what it is doing.

It was felt that the time had come for that sort of thing to be investigated, studied, analyzed, tied up to the official agencies, if you will; fundamental questions asked as to standards, as to inter-relationships between voluntary agencies themselves.

In this particular health activity, we have sometimes multiple developments; in one community, fifteen agencies engage in the care of crippled children. In the field of mental hygiene, much the same story. Questions that are in the mind of everyone are something like this: How are they related to each other? Do they stand in each other's way? Do they coöperate? Do they help the health officer? What does the health officer think about them? Are they really a part of the machinery of public health in America? These are the questions that are being attacked.

Selskar Gunn, a man of extraordinary ability, with a fine background, is giving his full time, all his energy, to attacking this problem. He has Philip Platt working with him; he has a good committee, and I think he has aroused the interest and good will of a large number of our people who in their own communities will now begin to ask questions; begin to look into their own situation; write back; call for help; they say: "Help us to formulate the sense of this thing." And we hope by the time this study, which is launched on a three year basis, is completed, we will know something about this giant.

If I am to take advantage of this grand opportunity, I bespeak for this effort your good will. Keep in touch with Selskar Gunn and Philip Platt, write to the National Health Council; raise issues; tell us of the problems you have; and if you get inquiries in the form of questionnaires to fill out, please help us and do it.

CHAIRMAN: Thank you, Dr. Dublin. I am going to enlist Dr. Dublin's help to get us a manuscript on this subject. Our efforts so far from the study staff have found them so absorbed in the job of getting the work done that we have not been able to give you manuscripts through the JOURNAL, but we have standing requests for those, and we hope to produce.

There are two large fields of interest here that have not yet had even slight attention, and I am thinking particularly of the public health nurses. The nurses here had interesting programs, not only separately for the Section but joint sessions with other Sections. I wonder whether Miss Dorothy Rood, of the University of Pittsburgh, would care to summarize the highlights from the public health nursing standpoint.

Miss Rood: One thing that stands out to me as a real highlight in nursing is the Curriculum Guide which has been prepared under the auspices of the U. S. Public Health Service and the N.O.P.H.N. The nutritional section of that guide was discussed in one of the meetings. I believe it offers an instrument which has not been presented in any other field, a study of what should go into the content of the training of a public health nurse. I think it has wide usefulness for health officers and others, as well as for those of us for whom it was prepared—those of us who are preparing nurses for public health work.

Another aspect was the field of community planning, and I think that planning must be done for the private nurses, the subsidiary groups and student nurses; and each community must be studied to see how and where the services would be carried by the ones who are left in the community.

Out of that grew a resolution which was passed by the Association yesterday, which I think had far reaching influence in nursing and in the programs of nursing, and that is that bedside care should be considered as an integral part of the nursing program—that it is important for health departments and the official agencies to include bedside care, just as much as the private agencies, in their program.

I think these constitute probably the greatest highlights that we have had, except for one current that I think has

run through all the sessions: the need of keeping on with the professional education of our young people, especially when our young nurses are going into the armed forces, we must recruit enough to keep on with our programs. We must keep on training personnel, so that we will not be short in the years immediately following the war.

CHAIRMAN: While we are on this subject, will Miss Dorothy Deming give us a resumé of the special session on Merit Systems?

MISS DEMING: We met in a rather small meeting to discuss what the A.P.H.A. is doing in the field of the Merit System. We discussed the matter from two points of view: (1) the rather intimate one as to what the A.P.H.A. can do for the Merit System supervisors in providing examination material for the examining of personnel in the states; (2) which was less intimate and a very general discussion, on what is the matter with the Merit System? what is good about it? what is bad about it? Do we want one?

As the result of a very lively discussion, we came to the conclusion that now more than ever before is the chance to train and to assign jobs to qualified personnel; partly because, if we are sharing our present personnel with the armed forces, the weight of responsibility must be carried by even better trained people than formerly. And, because when the war is over and the troops begin coming back, not only must we have trained personnel on the job to continue a high level of service, but we must be ready with the Merit System running and functioning, in order that the goal of qualified personnel appointed on the Merit System basis should be an actuality and not just a dream, which it has been for so many years.

We had the pleasure of having with us representatives from the U. S. Children's Bureau, Dr. Eliot, Miss Blakelee, and Dr. Dailey, and the members

of the consultant nursing staff of both the U. S. Public Health Service and the Children's Bureau; so that it was a true meeting of the groups concerned with the administering, the functioning, and the actual working out of the Merit System as it has been set up for us by the federal groups.

CHAIRMAN: Miss Deming might have gone on to tell you that Merit System questions are now available to the State Merit System Agencies for public health nurses, and now we are moving out into other fields in which shortly we shall have questions ready.

Miss Deming's associate in working in this field, and mine, is Dr. Mary Steichen, but in view of the shortness of the time, I am going to ask Dr. Steichen not to go on with this Merit System study, which some of us think is one of the high-water marks of the Annual Meeting, but instead to give us a resumé of what she heard at the luncheon session at which Sir John Orr of Aberdeen, Scotland, spoke.

DR. STEICHEN: One could have listened to Sir John with two attitudes: you could sit back complacently and say: "Let's see what they are doing on the other side?" Or, you could listen with a receptive attitude and say: "What have you got to give us, Sir John, that we can use?"

I think some of you who heard Sir John will agree that he mentioned several factors which certainly we could take over and take over fast. He mentioned, for instance, that everybody was concerned—everybody, men, women, and children—in increased food production. That is a job for all of us, and I imagine it will be undertaken and is being undertaken under the County Agents of the Department of Agriculture.

He mentioned the increased efficiency of distribution and rationing of foods, and I think people in this country are going to welcome the rationing of foods, because it will lead to a better and more

equitable distribution of the more vital elements of nutrition.

I was particularly interested in the description of the national loaf of bread which was established by the government; it sounds good to me, everybody who has tasted it says it is the best bread he has ever eaten.

Then there is the extra free rationing of very vital foods such as milk and eggs to mothers and children. We have got to come to that. That, plus the communal meal for all workers, leads to the conception of a leveling of the national diet: the poor people will come up and the richer people, who certainly do not need to be fed any better than they are as far as quantity is concerned, but often need to be fed better as far as quality is concerned, will come down until there is a broader scale of good nutrition.

The most important thing I got out of his address was that it reminded me of a school I know which burned down. It was a great disaster to the whole community, because the children and the parents were very much concerned with that school. The next day after the fire, every class met, and from then on it was a progressive learning process, a constructive use of a disaster for every single person in that school. So, by the time the school was rebuilt, the older children had taken part in construction; they knew what heating and ventilating meant; the little children had learned arithmetic by figuring what the school cost, etc.

Of course, you cannot burn a school down to provide a good constructive experience, just as nobody wants a war, but we can turn this war into a vital and lively experience if we use it constructively. I think that is what Sir John had in mind when he said that the medical profession should take up the cudgels and plan what they are going to do next, so the measures we take now will lead into a wider and more efficient

scale of achievement in public health.

CHAIRMAN: We should now look at the field of industrial hygiene and pick up a few of the high spots. Dr. Leonard Greenburg is here, a member of the council of that Section. Dr. Greenburg is in charge of industrial hygiene under the State Department of Labor in New York.

DR. GREENBURG: Mr. Chairman, in my opinion, the outstanding new development discussed by the Industrial Hygiene Section revolved around the question of nutrition and eating facilities for industrial workers. Dr. Boudreau presented a beautiful discussion of this subject, based on his research studies on the nutritional status of workers in selected industries.

There is clear indication that the nutritional status is far below anything which should be called adequate or desirable, and steps must be taken as soon as possible to provide more satisfactory diets for our American workers.

In the British experience, this followed along two general lines, and it would appear that in our American experience we will have to do the same thing—(1) the widespread use of publicity material, and (2) some kind of voluntary and official introduction of eating facilities and food into industry. The British law now requires that all plants having 250 or more workers be provided with a canteen. In the United States, there are no legal requirements in any state of the Union, and serious consideration must be given to this aspect of this important problem at the earliest possible moment.

There was a very interesting paper on the first survey of industrial nursing in America being made by a number of states in coöperation with the U. S. Public Health Service. The speaker provided a resumé of the results of 700 factory investigations along these lines. I think the Public Health Service will publish a bulletin on this subject, and



perhaps our JOURNAL will include such a paper. So far very little is known quantitatively about the status of industrial nursing in America.

There were several other interesting papers. The first recent paper to appear on the basic chemicals used in synthetic rubber, especially a substance known as styrene, and one of the workers from an important chemical company in this country presented a discussion of the toxic effects of styrene.

There were other good papers, on the training of industrial hygiene personnel, which leads one to believe that the pool, at the present time, is very limited, and we have been stumbling in our efforts to divide up the present personnel resources. It seems to me that we have been lacking in a certain degree of planning.

Mr. Chairman, if I may revert to one other question, which does not concern industrial hygiene, I would like to mention for a moment this question of sterilization of the atmosphere. Some years ago, I had the opportunity of studying an epidemic of cerebrospinal meningitis that took place between Manila and Honolulu, and the persons who were subjected to the epidemic and the victims of the epidemic, during which the mortality at times was 26 per cent; were transported on ships between the Philippine Islands and Honolulu. I was startled the other day, when I saw pictures of our American boys being transported in vessels of this same type, under similar crowded conditions, and I believe that this is a direct challenge for action by the American Army and the American Navy.

I think whatever we know about the sterilization of the atmosphere should, if it is safe, be put into effect under these unusual conditions when we are transporting large numbers of soldiers and sailors across the ocean, under conditions of severe crowding.

I cannot close without mentioning Dr.

Merewether's very interesting discussion at our luncheon. He told us how the British, without elaborate schemes of administrative diagrams but apparently with more persuasive and effectual personnel, had done a wonderful job in keeping factories safely going in Great Britain under the most trying conditions.

CHAIRMAN: Thank you, Dr. Greenburg. I am glad you called attention to Dr. Merewether's contribution. We also appreciate Dr. William Frazer's presence here. I do not see him in the audience, but you will find a very interesting manuscript by him in the December issue of the AMERICAN JOURNAL OF PUBLIC HEALTH, the manuscript which he abstracted in a session before the Health Officers Section at this meeting.

I call now on Dr. Baumgartner to tell us about birth records and vital statistics, and new uses that can be made of them in administrative service.

DR. BAUMGARTNER: This was a very interesting session, a joint session of the Vital Statistics Section and the American Association of Registration Executives. Birth certificates apparently have come of age and are serving various administrative uses. All of us are used to thinking of them as ways of finding out whether people put drops in babies' eyes, or sometimes we think of them as tools by which we can follow congenital lues. Some of us think of the weight that is recorded on birth certificates as a record of where premature babies are and send visiting nurses to visit them. Some of us have learned to find out about crippling conditions of children in this way, thus adding the names to crippled children's registries.

All of these were pointed out in this meeting, but the new use was to see a large map of Connecticut and on this map to see where the new babies had been born, and see the Connecticut State Health Department apparently planning where to send in more personnel, be-

cause more babies had been born down in this corner as a result of migrations to defense industries. Apparently birth certificates have a lot of uses aside from filing them in books.

CHAIRMAN: Thank you. I introduce now the Commissioner of Health of St. Louis, Dr. Bredeck. I would like to ask you whether, during the time you have made such a contribution to our comfort and convenience here, St. Louis and your Health Department have been able to get anything out of this Annual Meeting. I would like to pay a very sincere tribute to Dr. Bredeck. He has been our host here in a most acceptable way and, on behalf of the Association staff and on behalf of you all, I suggest that we give him a salute (applause for Dr. Bredeck).

DR. BREDECK: Thank you very much. Of course, the local health officer is interested in having a convention, for two purposes: In the first place, he feels a good deal like the cow who has been on the pasture too long until she grows thin. Another is that like the fellow who plays the same phonographic record too long: the listeners get tired of it. I have been talking public health in this community for a number of years, and I get the impression that they are getting tired of the record, and during this convention, I and other members of the department have learned a number of new ways of saying things and, of course, we are perfectly selfish about wanting you here.

We need the stimulation in this section of the country, and we have not looked upon it as a convention only for St. Louis, but the surrounding areas, East St. Louis and the County, the State of Missouri and the surrounding territory. And I have already seen the stimulation that occurs locally from such a meeting. People wonder why we do not get tired at the convention. Well, when you wait seventeen years for a convention, you can stand it much

longer than two weeks, and you go through it without feeling tired at all, because this will have definite beneficial effects in many ways locally.

And, of course, being somewhat of an optimist—and I think that is the only way you can get anywhere—we feel very much indebted in having the convention. I say that not only for myself but for all of those associated with related fields in public health. And as I stated the other evening, I hope our next convention will be here before another seventeen years. Thank you.

CHAIRMAN: Thank you, Dr. Bredeck. Is Dr. McGavran in the audience? I would like to have him take a bow. He is the Health Officer of St. Louis County, to whom we are also indebted, with his staff, who have worked so closely with Dr. Bredeck and his staff. At any rate, we give him a greeting and our renewed appreciation supplements what we said yesterday.

We have come to the closing moment. There are several live subjects here on which our participants have said they would be willing to comment. I am sorry to have to bring it to a close, but I know some of you have train appointments. There are two papers which Dr. Perkins said this morning he would like to comment on, one was on the subject of dental caries and the angle of its epidemiology. That appeared in the November issue of the AMERICAN JOURNAL OF PUBLIC HEALTH. He spoke to me about another paper, that by Drs. Twinam and Pope, on the subject of a clear-cut tuberculosis outbreak; that too is in the November issue.

Now, the Editorial Board, the editorial staff, and the Program Committee would be glad to have you express your opinion as to whether you like this kind of a wind-up session, or whether you would prefer to bring the meeting to a close on the subject of our special interests as distinguished from our common interests. We would be glad to

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hear your comments, because, if you want this kind of a thing, perhaps we can do it again.

I thank you for your undivided attention and tell you that, as we bring to a close the final session of this Seventy-first Annual Meeting, it is with a feel-

ing of mutual interdependence that we go home, ready to carry on and meet whatever situations we are faced with, always knowing that we have this body of colleagues and this kind of support that will carry us through whatever comes.

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## INSTRUCTION OF MEDICAL STUDENTS IN PREVENTIVE MEDICINE AND PUBLIC HEALTH

IN the latter part of October the meeting of the Association of American Medical Colleges and the meeting of the American Public Health Association overlapped to some extent. This, however, is not the important thing in relation to the October gathering of the members of these associations. What is important is the fact that each gave serious consideration to the question of instruction of medical students in preventive medicine and public health: what should be taught, and when it should be taught, and how.

The need for such consideration has long been obvious, and some three years ago the Association of the American Medical Colleges, at the request of the American Public Health Association, appointed a committee to work jointly with a similar committee of the latter organization to the end that there might be formulated jointly a program for instruction of medical students in preventive medicine and public health. Progress to date has consisted of: (1) a study of the problem as it is found in the various medical schools of the United States and Canada, and (2) collecting of documents which, on analysis, provide a cross-section of opinions of the majority of professors of preventive medicine and public health as to what is good and what is bad in the present situation, and what needs to be done about it. A report covering factual material was published in the April, 1941, issue of the *Journal of the Association of American Medical Colleges*, and at the October meeting of that association there was presented a summary of the opinions referred to above. The American Public Health Association for its part made this subject the theme of the meeting of its Committee on Professional Education, and in addition provided on its program for a panel discussion of this subject by those who actually teach it.

It appears then that this important subject is in the process of receiving the attention which it has merited. The committees concerned have received due encouragement from their respective organizations and, it is to be hoped, will act with such expedition as may seem wise under war conditions. They must,

of course, recognize on the one hand that all medical schools are at present harassed by accelerated programs, and by depleted faculties, and that there looms for the future a group of students not as mature as in the past, and perhaps to be selected by means not the most desirable. In view of these difficulties, the pressing of recommendations for immediate curriculum changes might at this time be inopportune. On the other hand, and in spite of the bedeviling things just mentioned, the committees will need to bear in mind that future graduates in medicine will go almost immediately into military service where the prevention of disease and mass medical service will loom larger than in civilian practice. In addition, it is possible that adjustments in the post-war period may carry newer responsibilities and newer concepts even into private practice, and thus for future civilian as well as for immediate military needs, the committees concerned may find it desirable to formulate rather quickly some general guide for instruction of medical students in preventive medicine and public health. But whether such a program is presented immediately or at a later date, the previous work of these committees leads one to believe that they will, in their final recommendations, remain practical; that there will be no tendency to impose a frozen teaching pattern on all medical schools; that they will recognize that medical schools differ in interests, organization, and resources, and will concede that, inasmuch as content, quantity, and quality of teaching in such departments as medicine and surgery vary from one medical school to another, so must there be differences in the teaching of preventive medicine and public health.

The matter has now reached a stage where one may well feel encouraged. The future work of these committees will be watched with interest.

### WANTED: A BIOPSY ON COMMITTEES AND BOARDS

THE Editor wants very much to publish in the *Journal* a paper on the subject of committees and boards; a paper that will exhibit their structure, and function, their anatomy and physiology, their "positive health" and their pathology. *Journal* readers, therefore, are invited to submit manuscripts on this subject. The two adjudged most satisfactory by the Editorial Staff will be published in the early summer. The deadline date is April 30, 1943. Manuscripts must be received by noon of that day.

We send out this call because we consider the matter important. Public health workers, particularly in the voluntary agency field, luxuriate in committees, are possibly addicted to them. Given almost any opportunity or even an excuse, and the health organization goes into a sort of parthenogenetic spasm and delivers itself of a full-blown committee which, in turn, tends to exhibit an amazing immortality. But it is not with these phenomena *per se*, that one need be concerned, for admittedly, small groups must from time to time act for large ones: for exploration of new subjects, for review of old ones, for establishment of policies, for maintenance of relationships, for liaison, for swift and definitive action.

Those who accept this invitation then, need not attempt to make a case for committees and boards: their necessity is generally conceded. The matter on which light is needed is a quite different thing, and has to do with the composition of committees in relation to their functions. Does there exist someone seasoned and weatherbeaten in public health committee work, who has acquired through

this process or retains in spite of it, an ability to analyze, classify, and philosophize in simple language, understandable to other people? Can that same person get across to his or her colleagues an understanding of the assets and liabilities of a committee each of whose members represents some special interest, and indicate what may be expected of a board of professionals, or of a council or intelligent persons serving neither as experts nor as delegates? It would be too much to expect this person for whom we are searching to prophesy just what might be born of a committee composed of all these ingredients; but because many of our public health committees are thus hybrid and hashlike in membership, we may hope that information will be forthcoming as to the circumstances and objectives which would indicate one type of membership or another. We, as Editor, have no convictions. We have seen boards of experts act scientifically but entirely in a vacuum; and we have naïvely attempted to get action out of committees in which age, sex, race, residence, religion, and occupation were in proportions seen only in the epidemiology of syphilis.

From where, and whom will come this taxonomy of committees and boards? Who will develop a document which will guide the health officer and the local executive secretary in the matter of committee appointments? Has the West Coast, New England, or the Deep South, or possibly the Middle West, a son or a daughter who will lead public health out of the wilderness of committee chaos?

We most distinctly do not want mere descriptions of how committees and boards are organized here or there, and we shall give scant attention to manuscripts propped up by categorical statements, adjectives, and adverbs. Please avoid the use of the word "dynamic." What we hope for is at least two penetrating, analytic, and judicial essays.

## BOOKS AND REPORTS

**Chronic Pulmonary Disease in South Wales Coal Miners—Medical Research Council. I. Medical Studies. Including a report by the Committee on Industrial Pulmonary Disease, a Medical Survey by P. D'Arcy Hart and E. A. Aslett, and a Pathological Report by T. H. Belt. London: His Majesty's Stationery Office, 1942. 222 pp. Price, \$3.00.**

The high standard set by previous special reports of the Medical Research Council is maintained by this latest contribution on chronic pulmonary disease in Welsh coal miners. In addition to the fact that silicosis is one of the principal industrial diseases in Great Britain, compensation statistics indicate that the main problem of certified silicosis lies in the South Wales anthracite mines. These circumstances determined the selection of this site for an intensive study of the etiological factors influencing the development of pneumoconiosis together with investigations of the clinical and pathological aspects of the disease.

Although the classification of lesions as (a) reticulation, (b) nodulation, and (c) consolidation, differs somewhat from the generally accepted nomenclature, radiological studies indicated that the frequency and degree of pathology were proportional to the occupation, age, and length of exposure of the miners to coal dust. Workers in anthracite mines showed substantially more silicosis than those in the bituminous fields and hard-heading workers developed more lesions than colliers and far more than surface workers. While it seems clear that development of silicosis is closely correlated with the duration and intensity of exposure to silica dust no

attempt apparently was made to measure that hazard in terms of dust concentration, particulate size or silica content of the dust.

The incidence of clinical tuberculosis diagnosed was low; even among miners with advanced pneumoconiosis, and the 95 per cent who reacted to the tuberculin test. In the opinion of local doctors tuberculosis is a less frequent cause of death in silicotic miners than either cardiac failure or non-tuberculous respiratory diseases. No attempt was made to diagnose tuberculosis on radiological appearances in the presence of pneumoconiosis.

Pathologically, pulmonary reticulation is considered as the earliest form of lesion which may be associated with respiratory disability. It is probably a type of fibrosis preceding consolidation but may co-exist with it, and probably is an integral part of silicosis (or anthraco-silicosis). ALTON S. POPE

**Intelligence, Power and Personality—By Dr. George Crile. New York: McGraw-Hill, 1941. 347 pp. Price, \$3.00.**

George Crile was one of the founders of the Cleveland Clinic, often popularly called the Crile Clinic. He is an internationally known surgeon, the author of many books and papers and the inspiration of many young surgeons. It was he who first made plausible, even though he did so by an inaccurate and incomplete theory, the minimization of emotional shock in certain surgical operations. This is his first book in several years and those of us who have known how hard he has worked on the theory proposed in this book, the collecting and measuring of specimens for

the McBride Museum of the Cleveland Clinic Foundation, have looked forward to it expectantly.

Dr. Crile has tried to correlate the energy requirements of various animals, including man, and many wild animals which he shot and dissected on the spot in various parts of the world, with the weight of the brain, the heart, and the endocrine glands. His data are given *in extenso*; his conclusions are nowhere very explicitly stated. Dr. Crile still further confuses the reader by introducing many vague terms and concepts without taking the trouble to define them or to relate them to previous concepts and definitions. For example, one of his ten biological principles is: "In higher animals, the positive pole of the bipolar mechanism is generated by the brain; the negative pole is generated by the heart and the red blood cells." It may sound like quibbling, but mechanisms are not bipolar and if the metaphor is to be taken from the field of electricity, one cannot say that a pole is generated. The reviewer confesses that this and many other similar paragraphs are incomprehensible to him.

Another sample: "Intelligence, power, and personality are dependent on the absolute and relative size of the brain, the thyroid gland, the heart and blood volume, the celiac ganglia and plexuses, and the adrenal-sympathetic system." The author does not define intelligence and there is no evidence that he is familiar with its definitive and technical meaning in psychological science. Power is certainly too broad a word to use in an unqualified way in such a statement, and personality, which is also not defined, can scarcely be conceived of in such grossly quantitative terms as to be included in a mathematical formula of this kind.

It is interesting to learn that the jaguar has a smaller heart and a larger adrenal than the timberwolf and a thousand other items of carefully col-

lected data of this sort. It is a stimulating theory that in some way the activity patterns of animals can be correlated with brain weight, heart weight, and gland weight. But it cannot be said that this book clearly indicates what this correlation is, or what the meaning of these data is. Psychiatry in particular, and medical science in general would be grateful for any contributions that would clarify the relation of the physical and chemical factors in personality with the psychological factors. This study, unfortunately, does not do so.

KARL MENNINGER

**Public Health Nursing Curriculum Guide—Prepared by the Joint Committee of the National Organization for Public Health Nursing and the U. S. Public Health Service. New York: National Organization for Public Health Nursing, 1942. 206 pp. Price, \$2.00.**

The *Guide* gives a somewhat detailed statement of desirable goals to be attained in the preparation of public health nurses, with helpful suggestions on educational methods and content. The following areas are covered: I. Introduction to Public Health Nursing; II. Public Health Nursing Services, (1) Maternal Health, (2) Infant Health, (3) Health of the pre-school child, (4) Health of the school child, (5) Industrial Hygiene, (6) Mental health, (7) Nutrition, (8) Oral health, (9) Acute communicable diseases, (10) Tuberculosis, (11) Venereal diseases, (12) Pneumonia, influenza, and the common cold, (13) Cancer, (14) Diabetes, (15) Heart diseases, (16) Orthopedic and plastic conditions; III. Methods of Learning as Related to Public Health Nursing; IV. Public Health Organization and Administration; V. The Field of Professional Work as Related to Public Health Nursing; VI. Public Health Nursing Organization and Administration; VII. Field Experience.



The *Guide* does not attempt to organize the above subjects into definite courses but suggests that they may be integrated into a curriculum as best suits the individual school.

The *Guide* renders a most useful service to those responsible for public health nursing education for it organizes in an authoritative manner the essentials of a public health nursing curriculum. Its educational philosophy and scientific content have been carefully reviewed by leaders in each of the many fields concerned and therefore represent the modern trends in public health. Although this book is intended primarily for persons interested in public health nursing education, it can be read with profit by anyone in the public health field.

H. W. BROWN

**Housing Yearbook—1942**—*National Association of Housing Officials, Chicago, Publication No. N 159.* 192 pp. Price, \$3.00.

This book is a compilation of a series of articles on housing progress during 1941 by various authorities in the field. Included in this edition are the following articles: Reorganization of Federal Housing Agencies; Division of Defense Housing Coördination Activities in 1941; Mortgage Ownership; A Stimulant to War Housing, Home Ownership, and Housing Standards; The Federal Home Loan Bank Board—1941; Farm Security Administration's Seventh Year in Rural Housing; Defense Housing under the Lanham Act; Housing Activities of the Federal Works Agency; Navy Housing; The Why and How in Housing Priorities; Rent Control Activities of the Federal Government—1941; Central Housing Committee Swan Song; Activities of National Unofficial Housing Agencies and Committees for 1941; Directory of Housing Agencies and an Index.

The present edition is an "economy" edition in that the state and local sec-

tion is omitted along with an account of NAHO's doings and the editors' annual summary.

C. P. STRAUB

**The National Formulary**—*Prepared by the Committee on National Formulary of the American Pharmaceutical Association. (7th ed.) Washington: American Pharmaceutical Association, 1942.* 690 pp. Price, \$6.00.

Both *The National Formulary VII* and *The United States Pharmacopoeia XII* have a particularly important place in medicine because they are the official sources of information on drugs. Since 1906 the standards for drugs as given in the various editions of these books must be adhered to rigidly by all manufacturers and distributors. On November 1 the new *United States Pharmacopoeia XII* and the *National Formulary VII* will replace the previous editions as standards.

The choice of preparations to be included in *The United States Pharmacopoeia* is determined by the Committee on Scope, who make their decision chiefly on whether or not a particular preparation is of therapeutic value. This is not true of *The National Formulary*. In that book the choice of preparations is determined by the extent to which preparations are prescribed and must therefore be stocked by the dispensary pharmacist. Because certain drugs long since replaced by more effective remedies are still prescribed in large quantities, *The National Formulary* is required to set up standards for them. It is thus we find in it drugs that are not even mentioned in medical college teaching, such as *Aralia* (American spikenard), *Areca* (betelnut), *Buchu*, *Sanguinaria* (blood-root), and true and false unicorn-root.

Great care has been taken by the Committee on Revision of *The National Formulary* to set up standards for each substance included in the book. They have done an excellent job.

By agreement, *The United States Pharmacopoeia* has preference over *The National Formulary* in the inclusion of preparations. For that reason some preparations that were present in the previous edition of *The National Formulary* are now found in *The United States Pharmacopoeia*, for example elixir phenobarbital. On the other hand, a number of pharmaceutical necessities, which include vehicles such as tinctures, elixirs, and waters, are found in *The National Formulary* having previously been in the *Pharmacopoeia*.

ARTHUR C. DEGRAFF

The *Pharmacopoeia* of the United States of America (12th ed.)—New York: Mack Printing Company, 1942. 880 pp. Price, \$7.50.

It is easy for members of the public health profession to take for granted the uniformity and dependability guaranteed by the U. S. Pharmacopoeia, now issued in a twelfth edition. This is truly a publication of international character of which there has been a Spanish edition for forty years. It is official in Costa Rica, Cuba, the Dominican Republic, in Nicaragua, Panama, the Philippines and Puerto Rico and is used in many other Pan American countries.

Among new U.S.P. items now official there are, among the anti-malarials, Pamaquine Naphthoate, Quinacrine Hydrochloride, Quinine Hydrochloride, Totaquine; among biological products are Human Immune Globulin, Human Measles Immune Serum, Human Scarlet Fever Immune Serum and Tetanus Toxoid new to this edition; the Sulfa drugs include Sulfapyridine, Sulfathiazole and Sulfanilamide; new antiseptics include Chloroazodin and Solution of Iodine. New in the realm of anti-syphilitics are Sulfarsphenamine, Bismuth and Potassium Tartrate, Bismuth Subsalicylate and Mercuric Salicylate. Among the new vitamin preparations are Ascorbic Acid, Menadione, Nicotina-

mide, Nicotinic Acid, Rice Polishings, Riboflavin, and Thiamine.

Throughout the volume a commendable adjustment to new discoveries and to current limitations in drug supply is evident. REGINALD M. ATWATER

The Mental Growth of Children from Two to Fourteen Years—By Florence L. Goodenough and Katharine M. Maurer. Minneapolis: University of Minnesota Press, 1942. 130 pp. Price, \$2.50.

As stated in the subtitle, this book is "A Study of the Predictive Value of the Minnesota Preschool Scales," and will be of greatest interest and value, as the foreword suggests, to the "careful student and professional worker in the field of mental measurement." There is, however, much of interest to the medical man who deals with children.

The Minnesota preschool scales for the study of mental development of young children have been in use for some time; they include both verbal and non-verbal scales which are scored separately. In this monograph the authors present a carefully constructed report of the development and validation of the tests which is followed by a study of their predictive value with regard to the later performance of the same children on other commonly used tests. A group of children from two to fourteen years of age was followed and retested at stated intervals. The work and statistical analyses were most carefully done. Evidence is adduced to show that mental development does not always proceed at a fixed rate, and it is suggested that there is a sex difference in the age at which the tests begin to have a predictive value. The superiority of the non-verbal scales over the verbal ones at early ages suggests to the reviewer their use with children whose acquisition of speech is delayed. These children are often brought for advice to the physician who is unable to answer

the parents' anxious question as to whether the child is mentally normal because of the inadequacy of the usual tests. The physician who, in the course of his care of young children, needs to know something of the validity of the usually administered tests, will find much of value in the brief historical survey of mental tests devised for young children.

WILLIAM S. LANGFORD

**Youth Looks at Marriage—***By M'Ledge Moffett. New York: Association Press, 1941. 48 pp. Price, \$25.*

Health workers who deal with young people will find excellent material in this pamphlet, presented as a guide for discussion groups from adolescence on. The author, who is Dean of Women and Director of Home Making Education at the Radford State Teachers College, Virginia, has succeeded better than others in objectifying this difficult area of marriage and family life. A mature person can hardly read this material without regret that it was not available in his own youth. He will wish to increase the exposure of youth today to this sane approach, especially when the marriage rate touches the present peak.

REGINALD M. ATWATER

**The Biological Action of the Vitamins—***Edited by E. A. Evans, Jr. Chicago: University of Chicago Press, 1942. 227 pp. Price, \$3.00.*

This book contains the fourteen papers presented at the symposium on "The Biological Action of the Vitamins," held in connection with the Fiftieth Anniversary celebration of the University of Chicago, September, 1941.

The material is presented not as a complete review of the field but rather as a series of papers summarizing the recent, most active subjects, each by an author with first-hand knowledge. The purpose has been well accomplished.

After an introductory chapter on

the historical developments of the subject, there follow sections dealing with the biochemistry and physiology of thiamine, riboflavin, nicotinic acid, pyridoxine, pantothenic acid, biotin, choline, phosphorus, and vitamin K. In other chapters clinical aspects have been discussed in relation to thiamine, riboflavin, nicotinic acid, pantothenic acid, and vitamin K. The book is the best single source of information on these aspects of the vitamins now available.

OTTO A. BESSEY

**The Sanitary Inspector's Handbook—***By Henry H. Clay, F.R., San. I., F.I.S.E.; Major, R.A.M.C. with an introduction by Sir Wilson Jameson, M.A., M.D., F.R.C.P., D.P.H. (Lond.). (5th ed.) London: H. K. Lewis & Co., Ltd., 1942. 534 pp. Price, \$5.25.*

A book that justifies its fifth editing in a decade, four editions having been exhausted, must be meeting a real and continuing need in the social order for which it is intended. As Sir Wilson Jameson, Chief Medical Officer of the British Ministry of Health, points out in his introduction to *The Sanitary Inspector's Handbook*, "the office of Sanitary Inspector has become more highly technical and specialized within the British Empire than anywhere else in the world, and the duties for which an inspector is responsible are extremely diverse." It is for the British public health service that the book is intended.

The diverse duties for which the inspector is responsible are introduced at the beginning of each chapter by a summary of the law, so far as it concerns the inspector. There follows an explanation of the technical aspects of the requirements of the law and its by-laws which keeps in mind the second purpose of the author, namely, the preparation of his reader for the examinations that will qualify him for appointment as a sanitary inspector. To that end, systematic outlines that will impress

themselves upon the student's memory are presented, wherever possible, to cover the salient factual information that the student should possess and about which most questions will normally revolve.

This wartime edition of Major Clay's book includes in its technical portions special reference to "conservancy," the British equivalent of our more realistic "excreta disposal," and to camp and rural sanitation, and, otherwise, too, brings the technical information down to date. New legislative enactments that appear to be permanent are added, but emergency enactments that will probably disappear with return to peace are not included. A wartime objective of the book is to meet the special needs of students during the suspension of normal courses of instruction. For the reader in the Americas, *The Sanitary Inspector's Handbook*, because of its close national orientation, is primarily of interest as a reference in comparative public health administration and sanitary legislation. GORDON M. FAIR

**The Family in a World at War—**  
*Edited by Sidonie Matsner Gruenberg.*  
*New York: Harper, 1942. 298 pp.*  
Price, \$2.50.

This is a timely volume conceived and brought to fruition by the board and staff of the Child Study Association of America. It is really a symposium of twenty well written chapters on various phases of family life in relation to the national emergency and national defense. Each chapter bears the marks of special consideration by an authority in his or her particular field. The chapters on "Children of Great Britain in Wartime," by Susan Isaacs, and "The Work of Women in England," by Martha M. Eliot, are especially challenging.

The appendix contains material that should prove very helpful in answering parents' questions as to how they should

meet war conditions. This material has been assembled by the staff of the Child Study Association and the U. S. Children's Bureau. A Commission on Children in Wartime of the U. S. Children's Bureau has prepared the Children's Charter in Wartime.

The editor of this volume in the first chapter sets the stage for the chapters which follow. She is to be congratulated on bringing together so much useful material when the preservation of the family is of paramount concern.

RICHARD A. BOLT

**Digest of State and Federal Laws Dealing with Prostitution and Other Sex Offenses—***Compiled under the direction of Bascom Johnson by George Gould and Roy E. Dickerson.* *New York: American Social Hygiene Association, 1942. 453 pp.* Price, \$5.00.

Here is a loose-leaf book containing digests of all federal and state laws dealing with prostitution and other sex offenses passed, up to and including September 15, 1941. Note the word loose-leaf, for therein lies the chief value of the book. As new material is gathered from time to time by publishers and distributors the book can be easily kept up-to-date.

Dealing first with the federal laws, then the states, in alphabetical order, the *Digest* presents its material under four headings as follows: (1) Activities of Exploiter of Prostitute Prohibited; (2) Activities of Prostitute or Her Customer Prohibited; (3) Other Sex Offenses Prohibited; (4) Digest of Supplementary Laws.

If nothing more, the *Digest* offers convincing proof of the confusion existing in the minds of both the legislative bodies and the general public, and definitely shows the need for a model law which will be all-embrasive.

Of special interest are the notes on the control of the sale of alcoholic beverages as it relates to prostitution

activities, and the four appendices covering the following subjects: (1) Laws Against Prostitution and Their Use; (2) Essential Provisions of State Laws for the Repression of Prostitution; (3) Milestones in the March against Commercialized Prostitution; (4) Venereal Disease Laws and Regulations; together with information and maps on premarital and prenatal laws of several states.

Containing practical knowledge of ways and means to prevent the "wastage of human resources resulting from prostitution and the undesirable conditions which accompany this evil business," the *Digest* should prove valuable to public health workers, legislators, and research workers.

BEN F. WYMAN

*A Brand New Baby*—By Margaret A. Stanger. Boston: Beacon Press, 1942. 132 pp. Price, \$1.75.

This attractive book meets a real need which many expectant mothers have experienced in trying to present to young children the important facts relative to birth and care of the newborn with normal development during the first year. The author recognizes that the arrival of a new baby in the home often presents problems in the lives of older children. She has taken into consideration that the bare facts alone do not suffice, but should be clothed for the child in the emotional medium which meets the requirements of modern child psychology.

The story begins in a normal way to interest the child and proceeds step by step to show what may be expected of a new-born baby, and what practical measures should be taken to meet its daily needs. The baby taken as a model in this story has been born in its own home and the procedures taken from the very beginning are somewhat different from those routines carried out in a modern obstetrical hospital. How-

ever, this does not detract from the pedagogical value of the presentation as a whole.

The large type printing and the charming illustrations by Pelagie Doane add a great deal to the book from the standpoint of the child. The book has been written primarily for the six and seven year old children and may be read to them at home or in the elementary grades.

The introduction announces that a guide book to accompany this volume, written by Elizabeth M. Manwell is available.

RICHARD A. BOLT

*Red Cross Home Nursing*—By Lona L. Trott, R.N., B.S. Philadelphia: Blakiston, 1942. 431 pp. Price, \$.60. Cloth, \$1.00.

The author of *Red Cross Home Nursing* is to be congratulated on covering for the lay reader the fields of health and sickness as capably as she has. With enthusiasm which is contagious, she introduces the reader to the essentials of healthful living and presents, step by step, practical simple procedures for the home nurse to use in caring for the sick. The author wisely refrains from being verbose on a given item but says just enough to whet the appetite of the reader to seek additional information and then she supplies a short list of books for further reading.

The only quarrel we have with this textbook is that its title does not suggest the richness of its content. In fact, approximately one half of the 390 text pages is devoted to factors related to keeping the well person well—to health promotion through individual and community effort. This reviewer makes note of what she considers a misleading title since she was particularly impressed with those units devoted to health.

There are many good points about this text. It is simple, interesting, and easy to understand. The reader is as-

sured of its soundness, for the author lists and frequently quotes her sources from accepted authorities in the various fields covered.

For the most part the text is a nontechnical presentation, but where the use of a technical vocabulary seems necessary the author defines the words in a way that the interested reader will appreciate. The illustrations are helpful. We commend the device of showing what not to do as well as what to do—in the instances where that form of motivation is employed. Finally, the busy housewife will welcome the small number of "Problems for Action" appearing at the end of each chapter. Only three or four are suggested. The fact finding activities should appeal to her and for the most part, the problems suggested are typical of ones the average individual encounters in real life situations, e.g., planning a model kitchen, preparing a budget, and the like.

*Red Cross Home Nursing* is written, it would appear, for Mrs. John Doe and her daughters. We believe they, and even father and brother, will like the book and want to own it, for it is a veritable mine of authentic information and a reliable index for more if desired.

MARGARET REID

**Sex Education in High Schools—**  
*By John Newton Baker, M.A. New York: Emerson Books Inc., 1942. 155 pp. Price, \$2.00.*

This book presents the results of a survey showing the experiences of high schools with courses in sex education and our present situation with respect to the teaching of sex hygiene at the secondary school level. Based upon this study of opinion and experience in the field, the book presents a statement of the need, the objectives, the opposition, the methods and technics, the rôle of the teacher, the name of the course, and the benefits of sex education. It discusses the best name for the

course of instruction, the question of segregating the sexes for such instruction, and the desirability of state leadership in the development of this program.

The last two chapters, entitled "The Scene Today" and "Where Do We Go from Here?" respectively, summarize the present situation and the probable next steps. In respect to all of the various topics mentioned, the book presents diverging and opposing viewpoints. It shows that the young people themselves desire such instruction and that the program has been very satisfactory and acceptable in some areas. While there are sharp differences in the attitudes of different states, the survey indicates a tendency toward more and better instruction in sex hygiene. Selected units of study and a selected bibliography are included. The book is clearly written and attractively printed. It presents a good summary of the present situation.

C. E. TURNER

**People Are Important—***By Floyd Kuch, Gordon Mackenzie and Margaret McClean. Chicago: Scott, Foresman and Co., 1942. 283 pp. Price, \$1.32.*

This book is as intriguing as its title, and as important as its subject, people. Although a high school text on applied psychology, and therefore outside the usual classification of public health literature, it contains many important lessons for the health teacher and health officer. The oft repeated lament of the late Dr. John L. Pomeroy, 25 years Health Officer of Los Angeles County, "What makes people do as they do?" is answered as fully as can be in this book.

To no one in the community are people more important than to the health officer. Their follies and foibles manifested in bizarre health behavior, together with their energetic health progress when once aroused and organ-

ized, often leave him in a dither of alternating pride and misgiving. If the teaching units in this book should be successfully and generally adopted in the nation's high schools, it will mark the beginning of a new era for health agencies.

Of special value to public health are the chapters for the young citizen on "Learning to Think Straight," and "Getting at the Truth." Here the student is guided into a series of interesting investigations and exercises through which he learns to recognize problems, approach their solution in a logical manner, gather data which are factual, and reach conclusions based on facts, free of bias. When the majority of adults approach their personal and community health problems in this manner public health will flourish. Other sections of related importance in explaining and guiding human behavior are titled "Things that make you go and stop," "Getting into and out of emotions: Emotions are the fabric of life and living," "Getting along with others." Incidentally, it is refreshing to find a school text which recognizes the

importance of learning to be good followers. Good followers are sorely needed in a country many of whose youth aspire to be leaders or they won't play.

As to format, type, and illustration, the book is a model of modern educational technic. One of the several styles of type used is aggravating to the astigmatic and presbyopic eye, but this is a minor matter to the average high school reader. One wonders if human society might not become dull if everyone succeeded in applying to the fullest extent the tolerance, understanding, wisdom, and self-control advocated herein. Like virtue, however, these are traits worth striving for, but never fully attainable. Too, heredity would doubtless preserve enough atavistic genes to spice our society with the occasional crank and misanthrope.

This book opens a new vista of hope and encouragement for the public health administrator. It is a contribution to the field of mental hygiene. It should be on the desk of every health educator.

W. P. SHEPARD

## A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

**Mister Nelson Says**—Fuel oil for thirty states and 96 million persons will be restricted about a third and will be rationed. Supplementary supplies may be available for households with infants, old or sick people, but we shall have to think in terms of "discomfort zones" with a slogan "keep the home fires burning—low." At 65° artificial humidification of the air in the typical home is unnecessary. Reduced temperature is not injurious to healthy persons adequately clothed.

ANON. Health Aspects for (sic) Fuel Rationing. J.A.M.A. 120, 5:370 (Oct. 3), 1942.

**Too Many Cooks**—Conflicts between health and labor departments that have prevented an all-out attack on New Jersey's rapidly exacerbating industrial health situation are reported upon by a committee of the State Consumers League. The linen may not be exactly dirty but there just is a trace of that telltale gray.

ANON. Need for an Industrial Health Program in New Jersey. Med. Care (Quarterly). 2, 2:118 (Apr.), 1942.

**On Forty-eight Fronts**—Venereal disease control and other social hygiene activities of all our united states and some of the larger cities therein, is reported in heartening detail in three succeeding issues to produce a handy compendium that you may want for reference.

ANON. Social Hygiene in Wartime. J. Social Hyg. 23, 4 (et seq.):185 (Apr.), 1942.

**When Emotional Cripples Work**—One person in twenty spends part of his life in a hospital for mental disease.

One in sixteen of the selectees was rejected by draft boards because of mental or nervous defects. Many of these mental cripples find their way into industry, geared now to a fast tempo. Here, then, is a problem which raises the question: what can industry do about it? The components of a successful program are discussed in this excellent paper.

CAMERON, E. S. Mental Hygiene in Industry. Pub. Health Nurs. 34, 10:54 (Oct.), 1942.

**Pellagra, Obesity, Underweight, Anemia**—Malnutrition does prevail in this land of plenty. Why? Among the causes are: infections, mental strain, dietary faults, ignorance, laziness, poverty, misleading food advertising, denaturing of staple foods, overconsumption of purified sugars, waste of good foodstuffs. How can these causes be corrected? Cleanse our health education of fads and selfish commercial propaganda, and make it comprehensible to the common man, says this convincing writer. He wonders how many vitamin B pills we must consume before we nurture sufficient intelligence to take one step that he proposes.

CARLSON, A. J. Food and Fitness. Sci. Month., 55, 5:403 (Nov.), 1942. (Another provocative paper by the same author.) The Challenge of Unused Human Resources. J. Am. Dietet. A. 18, 10:647 (Oct.), 1942.

**For Arctic Explorers, et al.**—Should you be that one in a thousand who goes roughing it in sub-zero weather, then be warned that even in tents and igloos, a Primus stove may generate more carbon monoxide than can escape through canvas or cracks in



the snow house. Poisoning has occurred under these conditions.

IRVING, L., *et al.* Experiments on Carbon Monoxide Poisoning in Tents and Snow Houses. *J. Indust. Hyg. & Toxicol.* 24, 8:213 (Oct.), 1942.

About Minerals—Sodium, potassium, calcium, magnesium, chlorine, iodine, phosphorus, sulphur, iron, copper, manganese, cobalt, and zinc in the human body's economy is the fairly inclusive subject of this year's Harben Lectures given at the University of Toronto.

McCOLLUM, E. V. Inorganic Elements Which Present Nutritional Problems of Practical Importance. *J. Roy. Inst. Pub. Health & Hyg.* 5, 9:165 (Sept.), 1942.

Prostitution, Social Protection and the Police—Houses of prostitution and red light districts in more than 300 communities have been closed in the current wartime effort to prevent venereal infections among the armed forces. What the social protection section and the National Advisory Police Committee are doing to effect further (and still badly needed) betterment in an improving situation is recounted in this and the accompanying papers.

NESS, E. The New Offensive Along the Police Front. *J. Social Hyg.* 28, 7:365 (Oct.), 1942.

While Doctors Disagree—"Sister Kenny's treatment is superb nursing and common sense . . . early deformities are not seen in those cases under her care in the Minneapolis hospitals." (vs.) ". . . this method in time will take its place among the others offered by the field of physical therapy as having been tried but found wanting." You've guessed it: these are just two opinions voiced in a panel discussion on poliomyelitis. You will be well repaid for your reading of the whole series of papers.

SABIN, A. B., *et al.* Pathology and Pathogenesis of Human Poliomyelitis (and

four related papers). *J.A.M.A.* 120, 7:506 (Oct. 17), 1942.

Almost a Quarter Finished High School—One valuable innovation of the 1940 census was the recording of information about the number of years of schooling completed by men and women over 25 years of age, by urban-rural, nativity, color, and sex status. Such data are helpful in understanding the behavior of our people as workers, consumers, voters, and beneficiaries of our health services.

SHRYOCK, H. S. 1940 Census Data on Number of Years of School Completed. *Milbank Quart.* 20, 4:367 (Oct.), 1942.

Not Statistics But Babies, Alive or Dead—Until the middle 20's infant death rates in urban areas were higher than rural; since that time the rural rates have been greater. City rates are lowest, but towns of 2,500 to 10,000 provide the least favorable environment for infant survival, for the town rate is 9 per cent higher than in the country areas. Extension of effective public health to small towns should save a lot of infant lives, wisely concludes this study.

SOMMERS, H. J. Infant Mortality in Rural and Urban Areas. *Public Health Rep.* 57, 40:1494 (Oct. 2), 1942.

What Workers Work Upon—Diets of a thousand aircraft employees—the new rich—were studied. Very few men were eating meals that meet good dietary standards. Too few colored vegetables were included, citrus fruits were neglected (and this was a Sunkist group, please note), and too little milk was drunk.

WIEHL, D. G. Diets of a Group of Aircraft Workers in Southern California. *Milbank Quart.* 20, 4:329 (Oct.), 1942.

Nursing for Small Industries—Twenty-two visiting nurse associations

reported upon the type of part-time nursing services they render under contract with 44 different mercantile or industrial firms. The nature of various types of service is tabulated and discussed. This would seem to be a promising but very tiny beginning of an enormous job.

WIESNER, D. E. Policies in Industrial Nursing by V.N.A.'s. *Pub. Health Nurs.* 34, 10:585 (Oct.), 1942.

**Preschool Toxoid Treatment—**Argument is presented for a reinforcing dose of unmodified diphtheria toxoid before entering school, to be administered to children immunized in infancy. A Schick-negative condition may be expected in 97 per cent of those who are so protected.

WILKEY, J. R. Diphtheria Toxoid and the Reinforcing Dose. *Canad. Pub. Health J.* 33, 9:446 (Sept.), 1942.

## BOOKS RECEIVED

OSLER'S PRINCIPLES AND PRACTICE OF MEDICINE. By Henry A. Christian. 14th ed. New York: Appleton-Century, 1942. 1500 pp. Price, \$9.50.

NUTRITION AND DIET THERAPY. Fairfax T. Proudfit. 8th ed. New York: Macmillan, 1942. 1068 pp. Price, \$3.25.

COMMUNICABLE DISEASES. By Nina D. Gage and John Fitch Landon. 3d ed. Philadelphia: Davis, 1942. 458 pp. Price, \$3.50.

NUTRITION AND THE WAR. By Geoffrey Bourne. 2d ed. New York: Macmillan, 1942. 148 pp. Price, \$1.50.

MANUAL OF WAR-TIME HYGIENE. By Dean Franklin Smiley. New York: Macmillan, 1942. 86 pp. Price, \$1.00.

WHEN DOCTORS ARE RATIONED. By Dwight Anderson and Margaret Baylous. New York: Coward-McCann, 1942. 255 pp. Price, \$2.00.

FUNDAMENTALS OF PSYCHIATRY. By Edward A. Strecker. Philadelphia: Lippincott, 1942. 201 pp. Price, \$3.00.

TABLES OF FOOD VALUES. By Alice V. Bradley. Revised. Peoria: Manual Arts Press, 1942. 224 pp. Price, \$3.50.

REPORT OF THE COMMITTEE ON TUBERCULOSIS IN WAR-TIME. Special Report Series No. 246. London: His Majesty's Stationery Office, 1942. 36 pp. Price, 30¢.

ANALYSIS OF REPORTS OF PHYSICAL EXAMINATION. Summary of Data from 19,923 Reports of Physical Examination. Selective Service System: Washington, 1941. 31 pp.

WE FIGHT SYPHILIS AND GONORRHEA, VOLS. 1, 2, AND 3, AND TEACHER'S HANDBOOK. Adult Education Materials Project. Chicago: Chicago University Press, 1941.

MICROMAX RESISTANCE THERMOMETERS FOR MEASUREMENT AND CONTROL. Catalog N-33C. Philadelphia: Leeds & Northrup, 1942. 45 pp.

TRICHINOSIS PROBLEM IN CALIFORNIA. Report of a Survey, 1940-1941. By K. B. Kerr. Sacramento: Department of Health, 1942. 37 pp.

PUBLIC HEALTH IN MANITOBA, 1941. Report of Study made by the American Public Health Association, 1942.

THE ROCKEFELLER FOUNDATION. International Health Division, Annual Report, 1941. 1942.

## ASSOCIATION NEWS

### Felix Joel Underwood, M.D. President-Elect

**D**R. FELIX JOEL UNDERWOOD, State Health Officer of Mississippi, was chosen President-Elect of the Association at the 71st Annual Meeting in St. Louis, Mo., in October. Dr. Allen W. Freeman, Professor of Public Health Administration, Johns Hopkins University, Baltimore, Md., was inducted into office as President. Dr. John L. Rice, Consultant to the New York City Department of Health, retired as President.

Dr. Underwood was born in Nettleton, Miss. He took his M.D. degree at the University of Tennessee in 1908, and thereafter practised medicine and served as part-time Health Officer of Monroe County, Miss., and finally as Director of the Monroe County Health Department until 1920. In 1921 he became Director of the Bureau of Child Hygiene of the Mississippi State Board of Health, and in 1924 State Health Officer.

Dr. Underwood has served, or is now serving, on many boards, commissions and conferences, including the Board of Directors of the Standard Life Insurance Company, the Executive Committee of the State Board of Public Welfare, the Board of Trustees of the Mississippi State Tuberculosis Sanatorium, the White House Conference on Child Health and Protection, and the National Malaria Committee. He has served as a member of the Board of Scientific Directors of the Rockefeller Foundation, and of the Public Health Committee of the Commonwealth Fund; he is a member of the Advisory Com-

mittee of the National Organization for Public Health Nursing. The Mississippi State Medical Association, the Southern Medical Association and the Conference of State and Provincial Health Authorities have honored him with the office of President.



FELIX JOEL UNDERWOOD, M.D.

Dr. Underwood was elected to membership in the Association in 1924, and to Fellowship in 1934. Since 1941 he has been a member of the Executive Board. He is Chairman of the Conference Committee between the Conference of State and Territorial Health Officers and the A.P.H.A. Committee on Professional Education, under whose guidance the significant Merit Systems Project is being developed.

## Sedgwick Memorial Medal for 1942 Awarded to Dr. C.-E. A. Winslow

THE award was made on October 27, 1942, during the Seventy-first Annual Meeting of the American Public Health Association in St. Louis, Mo., by Haven Emerson, M.D., Chairman of the Sedgwick Memorial Medal Committee. In presenting the medal, Dr. Emerson said:

"Charles-Edward Amory Winslow, friend of the poor and disadvantaged, standard bearer of Christian ideals in human relations, persistent searcher for the truth of causes and effects of human survival at ever higher levels, we greet you with an enduring affection for those very qualities of heart and mind that made the name of Sedgwick symbolic of the social application of biology.

"On the part of the committee authorized to make the award, I hand you this golden token that serves perennially to express our belief that the best that man has already done can and will be bettered by the loyal disciples of great teachers of thought and science of opinion and fact."

In accepting the award, Dr. Winslow said:

"I cannot tell you how deeply I appreciate this honor which you have conferred upon me. It means much because it comes from the American Public Health Association—the comradeship in which I have labored to the best of my ability for forty years—the brotherhood in whose achievements I have always felt a deep and a proud satisfaction. It is doubly precious because it comes by the hand of Haven Emerson whom I have honored and loved as a gallant and devoted leader in our common tasks. Above all, however,

I prize this award because it links my name for the moment with the name of one who was not only a great teacher but something much more vital and intimate. A superior in the church is known as one's 'Father in God.' To those of us who were intimately associated with him, Sedgwick was our Father in the Spirit.

"After all, the purpose of this award is not primarily to place each year a



C.-E. A. WINSLOW, DR.P.H.

crown on the brow of a more or less worthy recipient. It is to keep the laurel green on the memory of a great pioneer in American public health and, above all, a human being whose personality, whose soul, was far more signifi-

cant than any or all of his concrete achievements. There are not many in this hall who enjoyed so fully the privilege of his companionship as did Mrs. Winslow and I. We were both his pupils. We met in his laboratory. We labored by his side in the department for twelve years. We see his face and hear his voice tonight. We hope always to keep burning the torch which he lighted.

"Intellectually, Sedgwick, as a pupil of Martin, the associate of Huxley, was a child of the Victorian day—a day whose serene spaciousness, scientific reasonableness, and warm humanitarianism seems in these dark hours like some remote Golden Age of human history. Yet he had in him, too, a strong and essential mixture of the Puritan. He was never lulled into slackness by faith in automatic perfectionism. He knew that the world was a hard world and that progress comes only by ceaseless effort. He was alert to the call of duty 'stern daughter of the Voice of God.' The motive power in every hour of his life was service. He almost

never used the word; but he made the tacit assumption that the aim of every human being was to 'leave the world better and happier than he found it.' After one long and intimate talk with me he said, 'Well, Winslow, I think you can be a very useful man.' Not a rich man, not a successful man—a useful man.

"This is perhaps, more than any other, the attitude of mind that we must cultivate today. Not only in the winning of the war but in the even harder task of winning a durable peace, intelligent practical coöperation between man and man, between nation and nation, for the upbuilding of a better world is the task we must achieve.

"As recipient of the Sedgwick Medal in 1942 I stand here not in any merely personal capacity but as the representative of all of you who make up the brotherhood of public health. On your behalf, as well as on my own, I accept the challenge of Sedgwick's spirit and pledge our utmost efforts in meeting the most urgent crisis in the history of human civilization."

#### FELLOWS AND LIFE MEMBERS ELECTED AT ST. LOUIS ANNUAL MEETING

The Governing Council at its meetings in St. Louis, during the 71st Annual Session of the Association, upon recommendation of the Sections and the Committee on Eligibility, elected 133 new Fellows, 3 Honorary Fellows, namely, William Mowll Frazer, M.D., O.B.E., M.Sc., Medical Officer of Health of the City and Port of Liverpool, England, and Professor of Public Health at the University of Liverpool; E. R. A. Merewether, M.D., M.R.C.P., F.R.S., His Majesty's Medical Inspector of Factories, Ministry of Labor, London; and Sir John Boyd Orr, M.D., F.R.S., LL.D., Director, The Rowett Research Institute, Bucksburn, Aberdeenshire, Scotland.

Six life members of the Association were elected at the same time, namely, Muriel F. Bliss, C.P.H., Attleboro, Mass.; Marguerite F. Hall, Ph.D., Division of Hygiene and Public Health, University of Michigan; Wilton L. Halverson, M.D., Dr.P.H., Los Angeles County Health Officer, Los Angeles, Calif.; Edward A. Piszczek, M.D., Health Officer, Cook County Public Health Unit, Chicago, Ill.; David A. Van der Slice, M.D., Division of Hygiene and Public Health, University of Michigan, Ann Arbor, Mich.; and Robert G. White, M.D., Director, Division of Preventable Diseases, State Department of Health, Bismarck, N. D.

## OFFICERS, 1942-1943

*President*, Allen W. Freeman, M.D., Baltimore, Md.  
*President-elect*, Felix J. Underwood, M.D., Jackson, Miss.  
*Vice-Presidents*, Alice Hamilton, M.D., Hadlyme, Conn.  
 Felix Hurtado, M.D., Havana, Cuba  
 Frederick W. Jackson, M.D., D.P.H., Winnipeg, Man.  
*Treasurer*, Louis I. Dublin, Ph.D., New York, N. Y.  
*Executive Secretary*, Reginald M. Atwater, M.D., New York, N. Y.  
*Chairman of Executive Board*, Abel Wolman, Dr.Eng., Baltimore, Md.

NEW ELECTIVE MEMBERS OF THE GOVERNING COUNCIL WITH TERMS  
EXPIRING IN 1945

Gaylord W. Anderson, M.D., Washington, D. C.	Selskar M. Gunn, New York, N. Y.
Margaret G. Arnstein, R.N., New York, N. Y.	James P. Leake, M.D., Washington, D. C.
E. L. Bishop, M.D., Chattanooga, Tenn.	Arthur P. Miller, C.E., New York, N. Y.
Walter H. Brown, M.D., San Francisco, Calif.	Alton S. Pope, M.D., Boston, Mass.
V. M. Ehlers, C.E., Austin, Tex.	Huntington Williams, M.D., Baltimore, Md.

## NEW MEMBERS OF THE EXECUTIVE BOARD

James A. Doull, M.D., Cleveland, Ohio—1945  
 Charles F. Wilinsky, M.D., Boston, Mass.—1944  
 Abel Wolman, Dr.Eng., Baltimore, Md.—1945

## THE ST. LOUIS MEETING

ELSEWHERE in this issue an attempt is made to bring to *Journal* readers the flavor of the 71st Annual Meeting in St. Louis, October 27-30, through a stenotypist's report, only slightly edited, of the meeting's final session. This was announced under the title "Highlights of the 71st Annual Meeting." and the participants in the panel were members of the Editorial Staff and of the Editorial Board of the *American Journal of Public Health*. The panel leader was Dr. Reginald M. Atwater.

The discussions convey the scientific atmosphere and point up the many

matters with which public health workers are concerned in this war year. Because the most important feature of any meeting is the audience, we supplement the transcript of the "Highlights" session with facts and figures about the people who attended the Annual Meeting.

The total registration was 2,636. Every state in the Union was represented, many by more individuals than in any recent year. There were 38 from California, and 10 from Washington, for example. Missouri, as would be natural, stands highest numerically, with 627 registered delegates. Illinois is next

with 394, New York third with 239, and Michigan fourth with 139. Thereafter, the numbers drop, but only 6 states show less than 5 registrants each.

Mexico sent 18 delegates; Chile and Panama, 3 each; Bolivia, Colombia, Peru, Uruguay, Cuba, Costa Rica, 2 each, and Ecuador, Guatemala, Honduras, Brazil, Paraguay, and Haiti, 1 each.

Delegates from Canada numbered 32, from England 3, from Bermuda 1, from Scotland 1, and 1 delegate came from each of our own territories.

The United States Army, Navy, U. S. Public Health Service, Children's Bureau, Office of Defense Health and Welfare Services, Office of Civilian Defense, and many other federal official and national unofficial agencies were represented.

Fifteen related organizations and

conference groups met with the Association.

The Ninth Institute on Public Health Education, with a faculty of 65, enrolled 278 registrants.

Altogether there were held 176 sessions, group conferences, breakfasts, luncheons, and dinners, addressed by 397 speakers. All were well attended. The Annual Banquet brought together 778 guests.

Eighty scientific exhibit booths were occupied, lining on both sides the Promenade around Convention Hall in the Municipal Auditorium. These, and the 79 technical exhibit booths in Convention Hall itself, presented perhaps the most impressive exposition the Association has sponsored to date.

Resolutions of appreciation to the Local Committee and to its Chairman, Dr. Joseph F. Bredeck, were adopted.

## RESOLUTIONS

THE following Resolutions were unanimously adopted by the Association at the Seventy-first Annual Meeting in St. Louis, Mo., October 29, 1942.

### 1. APPRECIATION TO DR. BREDECK AND THE LOCAL COMMITTEE

RESOLVED that the American Public Health Association expresses its grateful appreciation to the St. Louis Local Committee and to the agencies and individuals represented thereon.

RESOLVED that the thanks of the officers and members be extended to Dr. Joseph F. Bredeck, Health Commissioner of St. Louis and Chairman of the Local Committee, and to the chairman and members of the several subcommittees, whose services have contributed so markedly to its success.

### 2. APPRECIATION TO THE ST. LOUIS HEALTH DIVISION

RESOLVED that the American Public Health Association expresses its thanks to the St. Louis Health Division and its personnel for their valuable assistance in the conduct of the Seventy-first Annual Meeting.

### 3. APPRECIATION TO THE LADIES' ENTERTAINMENT COMMITTEE

RESOLVED that the American Public Health Association expresses its appreciation to the Ladies' Entertainment Committee for their gracious hospitality and their many courtesies extended to the delegates, and be it further

RESOLVED that our thanks be extended to Mrs. Martin J. Glaser, Chairman, and Mrs. Joseph C. Peden, Vice-Chairman of the Ladies' Entertainment Committee for their thoughtfulness in our behalf.

### 4. APPRECIATION TO THE ST. LOUIS CONVENTION BUREAU AND TO THE ST. LOUIS AUDITORIUM

RESOLVED that the American Public Health Association acknowledges its gratitude to the St. Louis Visitors' Convention Bureau and to the Municipal Auditorium and their personnel for their splendid cooperation in

making such excellent facilities available for the Seventy-first Annual Meeting.

#### 5. APPRECIATION TO THE PRESS

RESOLVED that the American Public Health Association acknowledges its indebtedness to the press, national, state, and local, for its service in connection with the Seventy-first Annual Meeting.

#### 6. APPRECIATION TO EXHIBITORS

RESOLVED that the American Public Health Association expresses its grateful appreciation to the friends and coöperators who have presented at its Seventy-first Annual Meeting the excellent exhibits, both scientific and technical, which are of such great interest and value to the public health profession.

#### 7. THANKS TO HOTELS

RESOLVED that the American Public Health Association expresses its appreciation to the hotels in St. Louis for their assistance in the conduct of the Seventy-first Annual Meeting.

#### 8. WARTIME MATERNAL AND CHILD HEALTH

WHEREAS the war has created many conditions that endanger the lives and well-being of infants and children, including particularly life in crowded, unfit dwellings and communities, lack or inadequacy of child health services and medical and hospital care for sick children, crowded maternity wards and dangerously crowded nurseries for new-born infants, and inadequate maternity care, resulting in too early discharge of women and their infants from hospital, and

WHEREAS in many places, as the population has grown rapidly because of war industries or military establishments, the provision of health and medical service has not kept pace, and

WHEREAS many thousands of women are being drawn into war production industries or into work on farms or into domestic service, including mothers of young children, with the resulting need for special health and welfare services for children, and

WHEREAS boys and girls of secondary school age are seeking work in factories or farms, in many cases work that taxes their physical strength and endurance and affects their emotional and social stability, and

WHEREAS the changes in family and com-

munity life created by the war, especially the absence of the father from the home, are causing many additional emotional and social problems among children and youth with resultant increase in delinquency, and

WHEREAS the morale of the men in the armed forces depends in no small degree on the knowledge of the health and well-being of their wives and children at home, therefore be it

RESOLVED that the American Public Health Association go on record as urging: (1) that immediate attention be given by appropriate public and private health agencies to the expansion in all practical ways of programs of maternity care and health service and medical care for children, especially those in areas affected by war industries and military establishments; (2) that attention be directed to the health and medical services, including mental hygiene, required for children of working mothers and for adolescents and youth who are about to leave school for work or are already employed in war industries, on farms or in other essential service trades; and (3) that special attention be given to making available adequate provision for maternity care of the wives of men in the military services and for health and medical service for their children.

#### 9. ON MERIT SYSTEMS

WHEREAS the indefinite professional status and insecure tenure of employment of public health personnel in many health jurisdictions of the United States has been a serious handicap to the recruitment and retention of qualified personnel, and

WHEREAS, notwithstanding the serious obstacles that arise from the war emergency, substantial progress has been made toward acceptable systems of personnel administration on a merit basis, therefore be it

RESOLVED that the American Public Health Association reaffirm its faith in a properly conceived and administered system of personnel administration and that we urge the appropriate federal, state, and local health officials to perfect and extend those systems now in existence and in the course of development; and be it therefore

RESOLVED that professional qualifications be upheld for those persons seeking permanent status and that, when the emergency becomes so acute that inadequately trained personnel must be employed, such personnel be placed on temporary appointment in special grades below those which the position would normally rate.



## 10. LOCAL HEALTH UNITS

WHEREAS, the immediate emergencies of war-time and the continuing necessities of a nation at peace require health protection for all within our boundaries, and

WHEREAS, the most effective state and national health services can be provided only when all communities have accepted the responsibility of applying the science and art of preventive medicine as a permanent function of local civil government, therefore be it

RESOLVED that all practical measures be taken by the officers and the Executive Board of the American Public Health Association to promote the creation and adequate support of health services by local government throughout the United States and Canada to the end that no community of our people shall be left without the public care which can be best supplied only through full-time trained medical officers of health with sufficient numbers of qualified assistant personnel, and be it further

RESOLVED, that collaboration with other professional, official and voluntary organizations be sought to obtain total coverage of these nations by local health units at the earliest practicable date.

## 11. CONTINUED TRAINING OF PUBLIC HEALTH PERSONNEL

WHEREAS the present emergency puts unprecedented demands upon public health personnel, and

WHEREAS the war period is presenting serious and numerous problems requiring exceptionally well trained professional public health personnel, and

WHEREAS it would be reasonable to expect

RESOLUTION FROM LATIN AMERICAN  
SANITARY ENGINEERS AT  
ANNUAL MEETING

At the banquet session of the 71st Annual Meeting of the Association held in St. Louis, Mr. Luis Pachon Rojas, Sanitary Engineer of the Ministry of Health and Labor of the Republic of Colombia, and on behalf of all the Latin American sanitary engineers in attendance at St. Louis, presented the following resolutions:

"The Latin American Sanitary Engineers attending the 71st Annual Meeting of the

that this situation will be aggravated during the post-war period, now therefore be it

RESOLVED that all health agencies be urged to make every possible effort to continue the professional training of all types of personnel, utilizing to the fullest extent funds available from all sources.

## 12. NUTRITION

WHEREAS the importance of upholding health standards has assumed new significance during the war, and

WHEREAS we have come to a new realization of the importance of adequate diet, therefore be it

RESOLVED that it is an important function of any health agency, including the schools, to take every step toward providing the adult as well as the child population with a properly balanced diet, taking full advantage of the systems available through the U. S. Department of Agriculture in the establishment of suitable school lunch and school milk programs.

## 13. MORBIDITY NURSING

WHEREAS the dislocation of considerable segments of the population and the dislocation of physicians, nurses, and dentists emphasizes the desirability of extending nursing care to the sick in their homes, and

WHEREAS the accomplishment of this objective in many areas may now be possible through the coördination of all public health nursing services, including the full utilization of auxiliary services, therefore be it

RESOLVED that the American Public Health Association endorse the principle that nursing care of the sick in their homes should be an integral part of a community public health nursing program.

American Public Health Association in St. Louis, Mo., have unanimously approved the following motions: 1st: To express our deepest gratitude to the Pan American Sanitary Bureau for the kind invitation to attend the 71st Convention of the American Public Health Association and also for the timely opportunity to meet most of the outstanding men engaged in public health activities in this country. 2nd: To voice our sincere appreciation to the American Public Health Association for the hearty welcome that was extended to us on this occasion which demonstrates the community of ideals that reigns among those who are devoting their efforts to the welfare of the people of this hemisphere. 3rd: To thank the Conference of

State Sanitary Engineers and the Conference of Municipal Public Health Engineers for their generous gesture in extending to us the privilege and high honors of membership in their organization and to assure them our fullest collaboration in the solution of the inter-American sanitary engineering problems and the complete support of our group."

A sustained round of applause greeted the presentation of these resolutions and a rising vote of appreciation was accorded the visitors at the suggestion of Harry S. Mustard, M.D., the presiding officer.

#### DELEGATION FROM MEXICO AT ST. LOUIS A.P.H.A. MEETING

The delegation from Mexico at the 71st Annual Meeting of the Association in St. Louis in October was headed by Dr. Angel de la Garza Brito, Dean of the School of Hygiene and Public Health in Mexico City. Also in attendance were Dr. Manuel Gonzalez Rivera, the Supervisor General and the Chief of the technical staff of the Federal Department of Health, Mexico City.

From the Bureau of Venereal Diseases were Dr. Enrique Villela, Chief of the Federal Bureau. Dr. Juan L. Soto, the Director of the Federal District Bureau, and Dr. Samuel Villalobos. Carlos Lopez Fuentes was in attendance, representing the public health engineers

from the Federal Bureau of Sanitary Engineering.

#### LATIN AMERICAN COUNTRIES REPRESENTED AT A.P.H.A. MEETING

Among those in attendance at the 71st Annual Meeting in St. Louis were sanitary engineers from several Latin American countries, present as guests of the Pan American Sanitary Bureau. Included in this list were the following sanitary engineers from the countries indicated:

F. A. Aragon, Costa Rica  
Angel Balcarcel, Guatemala  
Julio Caballero, Chile  
Ruperto Casanueva, Chile  
Felipe de Santiago, Uruguay  
Gerald Ewald, Haiti  
Carlos Lopez Fuentes, Mexico  
Carlos Guardia, Panama  
Julio Jauregui, Bolivia  
Luis Mantilla, Peru  
Renan Mendez, Costa Rica  
Sergio Palacios, Honduras  
Louis Pachon Rojas, Colombia

Accompanying the visitors were the following officials connected with the Pan American Sanitary Bureau.

Dr. E. C. Ernst, *Assistant Director*  
J. Corigliano, *Fiscal Officer*  
E. D. Hopkins, *Sanitary Engineer*  
W. N. Dashiell, *Sanitary Engineer*  
Dr. A. A. Moll, *Secretary*  
Dr. John R. Murdock, *Traveling Representative*.

## APPLICANTS FOR MEMBERSHIP

*The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.*

#### *Health Officers Section*

Frank M. Baker, M.D., East Side Health District, East St. Louis, Ill., District Asst. Epidemiologist, State Public Health Dept.  
Caroline H. Callison, M.D., Coosa County Health Officer, Rockford, Ala.  
H. L. Chambers, M.D., City Hall, Lawrence, Kan., Director, Douglas County Health Unit  
Everett H. Ellinwood, M.D., P. O. Box E, Snow Hill, N. C., Epidemiologist and Health Officer, State Board of Health

Floyd W. Highfill, M.D., Box 308, Duncan, Okla., Director, Stephens County Health Dept., State Health Dept.  
S. H. Kash, M.D., 4523 S. Sheridan Drive, Cudahy, Wis., Health Officer  
Leslie W. Knott, M.D., M.P.H., 216½ E. Monroe St., Springfield, Ill., Asst. Chief, Div. of Local Health Admin., State Dept. of Public Health  
Louis G. Llewellyn, M.D., Deputy State Health Officer, Pocomoke City, Md.

James L. Mudd, M.D., 634 N. Grand Blvd.,  
St. Louis, Mo., Tuberculosis Controller,  
Health Division, City of St. Louis

Joseph T. Nardo, M.D., Fayette County  
Health Dept., Somerville, Tenn., Director

Edgar W. Norris, M.D., Garden Apts. 5-F,  
Baltimore, Md., U. S. Public Health Serv-  
ice, Liaison Officer, Army 3rd Service  
Command

Sidney Olansky, M.D., City-County Clinic,  
700 W. 10th St., Jacksonville, Fla., Asst.  
Surgeon (R), U. S. Public Health Service

Maurice A. Roe, M.D., B.M.A. Bldg., Kansas  
City, Mo., Surgeon, U. S. Public Health  
Service

Bernard A. Schwartz, M.D., 1119 Carew  
Tower, Cincinnati, Ohio, Heart Consultant,  
Cincinnati Health Dept.

Oliver P. Sizemore, M.D., Box 388, Durant,  
Okla., Director, Bryan County Health Dept.

John A. Urban, D.D.S., 1537 S. Grand Blvd.,  
St. Louis, Mo., Supervisor, Municipal  
Clinics

Charles L. Williams, Jr., M.D., Craven County  
Health Dept., New Bern, N. C., Asst.  
Surgeon, U. S. Public Health Service

James E. Wolfe, M.D., City Hall, Wichita,  
Kan., Director of Public Welfare

Major William J. Wood, M.C., 6 Detachment,  
RCAMC, Queen St., Halifax, N. S., District  
Hygiene Officer, Canadian Army

#### Laboratory Section

Casper G. Burn, M.D., 726 Ocean Ave.,  
Brooklyn, N. Y., Dept. of Pathology, Long  
Island College of Medicine

Roy F. Gilley, Jr., B.S., 101 Spring St.,  
Hartford, Conn., Sanitary Chemist, State  
Health Dept.

Sister Anna Catherine Lawlor, Ph.D., College  
of St. Elizabeth, Convent Station, N. J.,  
President

#### Vital Statistics Section

Jesse B. Lasater, 4941 Arsenal St., St. Louis,  
Mo., Deputy Registrar, Bureau of Vital  
Statistics

#### Engineering Section

Domenic Capone, B.S., State Health Dept.,  
Elkton, Md., Asst. Public Health Engineer,  
U. S. Public Health Service, States Rela-  
tions Division

Robert P. Cherry, B.S., 3200 W. Douglas,  
Wichita, Kan., County Sanitary Engineer,  
Sedgwick County Health Dept.

William W. Cormack, B.S., 304 Essex Bldg.,  
Norfolk, Va., Supervising Sanitary Engineer,  
State Dept. of Health

Wilbur S. Feagan, B.S., 300 W. Armour,  
Ellison Hotel, Kansas City, Mo., Consultant

Public Health Engineer, City Health Dept.  
Walter C. Hamblett, B.S., 922 N. 16th, Apt. 2,  
Fort Smith, Ark., Asst. Public Health En-  
gineer, U. S. Public Health Service  
Lieut. John C. Oliver, Jr., S.C., Headquarters,  
MRTC, Camp Barkeley, Tex., U. S. Army,  
Sanitary Corps

#### Industrial Hygiene Section

Francis E. C. Ballard, M.D., M.P.H., 1521  
Masonic Ave., San Francisco, Calif., Med-  
ical Officer, Bureau of Industrial Health,  
State Dept. of Health

Robert M. Heilman, M.D., 1822 Campbell,  
Topeka, Kan., Director of Industrial Hy-  
giene, State Board of Health

Hedwig S. Kuhn, M.D., 112 Rimbach, Ham-  
mond, Ind., Ophthalmologist

Samuel M. Peck, M.D., National Institute of  
Health, Bethesda, Md., Surgeon (R), U. S.  
Public Health Service

Jack C. Varley, 1200 Switzer Ave., St. Louis,  
Mo., Vice-President in charge of General  
Production, Baird & McGuire, Inc., Manu-  
facturing Chemists

#### Food and Nutrition Section

Rosilyn B. Frank, 49 Ellsworth Rd., Larch-  
mont, N. Y., Chairman, Nutrition Com-  
mittee, Westchester County War Council  
Evelyn Hollen, M.S., 3823 University Ave.,  
Des Moines, Iowa, Nutritionist, State Dept.  
of Health

Icie Macy Hoobler, Ph.D., 660 Frederick St.,  
Detroit, Mich., Director, Research Labo-  
ratory, Children's Fund of Michigan

Joseph H. Perkins, M.S., 530 Cedar Lane,  
Swarthmore, Pa., Chief Chemist and Direc-  
tor of Control Div., Charles E. Hires Co.,  
Philadelphia, Pa.

William A. Sodeman, M.D., 1430 Tulane  
Ave., New Orleans, La., Professor of Pre-  
ventive Medicine, Tulane University, Med-  
ical School

Paul H. Tracy, Ph.D., 104 Dairy Manufac-  
turers, Urbana, Ill., Professor of Dairy  
Manufacturing, Univ. of Illinois

Irma F. Tual, M.S., 726 Jackson Place, Wash-  
ington, D. C., Home Economics, Director,  
National Assn. of Food Chains

#### Maternal and Child Health Section

Zelly C. Alpert, D.D.S., 70 College St., New  
Haven, Conn., School Dentist, in charge of  
Dental Clinic, New Haven Dept. of Health

M. Eleanor Blish, M.D., State Bureau of  
Health, Augusta, Me., Director, Div. of  
Maternal and Child Health

Mary B. Cook, M.D., 700 Broad St., Nash-  
ville, Tenn., Acting Director, School Health  
Service

Irma C. Vogel, R.N., 424 S. Kickapoo St., Lincoln, Ill., Consultant Nurse for Maternity Hospitals, Div. of Maternal and Child Hygiene

#### *Public Health Education Section*

Margaret B. Cowdin, 1129½ S. 2nd, Springfield, Ill., Supervisor of Health Education, State Dept. of Public Health

John L. C. Goffin, M.D., 1134 N. Hudson Ave., Hollywood, Calif., Supervisor of Health Education, Los Angeles City Board of Education

Mary E. Matthews, B.S., 507 N. Wilmington St., Raleigh, N. C., Laboratory Technologist, Malariology Dept., State Laboratory of Hygiene

Frieda Schicht, Room 3, Municipal Courts Bldg., St. Louis, Mo., Chief of Secretarial Service and Public Health Education, St. Louis Health Div.

Susan M. Tully, A.B., 25 Blossom St., Boston, Mass., Director of Health Education, Boston Health Dept.

#### *Public Health Nursing Section*

Florence E. O. Anderson, 4643 Lindell Blvd., St. Louis, Mo., Staff Nurse, Municipal Visiting Nurses

Helène M. Bonneau, R.N., 910 S. 6th, Ponca City, Okla., Supervisor, Creek County Health Dept.

Ida E. Borth, Room 35, Municipal Courts Bldg., St. Louis, Mo., District Supervisor, Municipal Visiting Nurses

Myrtle T. Cross, R.N., Tuberculosis Study, Franklin, Tenn., Supervising Nurse, State Dept. of Health

Marion A. Curtis, B.S., Court House, Billings, Mont., Supervisor, Public Health Nursing, Yellowstone County Public Health Service

Phyllis P. Harris, M.S., 121 Millard Hall, Univ. of Minnesota, Minneapolis, Minn., Instructor

Marguerite L. Hays, R.N., B.S., Marion County Health Dept., Fairmont, W. Va., Supervising Nurse

Mary I. Humphreys, R.N., 5455 Delmar, St. Louis, Mo., Teaching Supervisor, Municipal Visiting Nurses

Margaret A. Lagerstrom, R.N., 655 Columbia Pike, Franklin, Tenn., County Health Nurse, Williamson County Health Dept.

Petronilla R. Madden, R.N., B.S., 4250 Neosho, St. Louis, Mo., Special Supervisor, Communicable Disease and Tuberculosis Nursing Service

Lucille May, R.N., 5022a Tholozan, St. Louis, Mo., Field Supervisor, Municipal Visiting Nurses

Freddy-Jane Moser, R.N., B.S., 712 S. 9th St., Pocatello, Ida., Public Health Nurse, Bannock County Health Unit

Stella A. Piotrowski, R.N., 3411 Evaline, Hamtramck, Mich., Acting Director, St. Francis Hospital School of Nursing

Marie D. Richardson, B.S., 1318 Owyhee St., Boise, Ida., Staff Nurse, City-County Health Unit

Rose C. Schauer, R.N., 6229 Clifton Ave., St. Louis, Mo., Supervisor, Maternal and Child Health Nursing Service, Municipal Visiting Nurses

Catherine E. Sheckler, M.A., 64 Pearl Drive, Greenlee Village, Pittsburgh (10), Pa., Director, Public Health Nursing, Duquesne Univ.

Dorothy E. Sitton, R.N., 4404 Laclede, St. Louis, Mo., District Supervisor, Municipal Visiting Nurses

Bertha Smith, R.N., 8501 Drury Lane, St. Louis, Mo., Supervisor, Municipal Visiting Nurses

Katherine E. Terry, R.N., 3855 Hartford, St. Louis, Mo., Field Supervisor, Municipal Visiting Nurses

Janet I. Tidrick, A.B., 1269 Topeka Blvd., Topeka, Kan., Consultant, State Health Dept.

Wilma A. Tingen, R.N., 1803 Pine, St. Louis, Mo., District Supervisor, Municipal Visiting Nurses

Ann Vanek, R.N., B.S., 2643 Oregon, St. Louis, Mo., Supervisor, Parochial School Hygiene Nursing Service, Municipal Visiting Nurses

#### *Epidemiology Section*

David Bodian, M.D., 1901 E. Madison St., Baltimore, Md., Assoc. in Epidemiology, Johns Hopkins Univ.

Howard A. Howe, M.D., 1901 E. Madison St., Baltimore, Md., Assoc. Professor of Epidemiology, Johns Hopkins School of Hygiene and Public Health

#### *Unaffiliated*

John V. Lawrence, M.D., 507 S. Euclid Ave., St. Louis, Mo., Director of Washington University Clinics

Marietta B. Tawney, M.A., 502 W. Marie St., Urbana, Ill., Co-Chairman, Illinois State-Wide Committee

## EMPLOYMENT SERVICE

The Association Employment Service seeks to bring to the attention of appointing officers the names of qualified public health personnel and to act as a clearinghouse on employment. This is a service of the Association conducted without expense to the employer or employee.

From the registry of persons available, selected announcements are published from time to time. Appointing officers may obtain lists of all registrants on request.

Address all correspondence to the Employment Service, American Public Health Association, 1790 Broadway, New York, N. Y.

### POSITIONS AVAILABLE

U. S. CIVIL SERVICE COMMISSION. Public Health Nursing Consultants, 5 grades. See November *American Journal of Public Health*, or write U. S. Public Health Service, Washington, D. C.

Merit System Council, Oregon State Board of Health and Crippled Children's Division, has announced merit examinations in practically all public health fields. See November *American Journal of Public Health*, or write H. J. Sears, Merit System Supervisor, P. O. Box 88, Portland, Ore.

Indiana State Personnel Division announces that applications may be filed for positions in orthopedic nursing, medical positions (5 classes), and local public health director. See November *American Journal of Public Health*, or write Indiana State Personnel Division, 141 South Meridian Street, Indianapolis, Ind.

Physician, man or woman, as director of Division of Maternal, Child and School Hygiene in southern city department of health. Woman physician with pediatric training preferred, public health experience not essential. To operate prenatal, infant and preschool clinics and promote school health program. Salary commensurate with ability and qualifications of applicant. Apply Box J, Employment Service, A.P.H.A.

Southern state department of health seeks several obstetric and pediatric consultants, requiring a minimum of a year's residency in a specialty, immunity to draft and preferably training in public health. Men and women are eligible. Salary \$300 per month plus travel. Apply Box C, Employment Service, A.P.H.A.

Public Health Engineer and director of Division of Sanitation of a city and county health unit; population 145,000 in the Midwest. Salary \$3,180 and travel allowance. Box E, Employment Service, A.P.H.A.

The Flint Civil Service Commission will consider applications for Executive Health Officer of the Flint Department of Health. Applicants must be medical graduates with a valid license to practise medicine in Michigan or eligibility for such license; also must have practised

medicine and surgery for five or more years and had considerable experience in public health work. There will be no written test, qualifications being judged solely from review of experience, education and training and an oral examination. Present incumbent is on military leave of absence under circumstances which will probably extend for a period of five years. Staff consists of over fifty professional and technically trained employees. Probable salary \$5,400. Inquiries should be directed to Foster B. Roser, Director, Flint Civil Service Commission, City Hall, Flint, Mich.

The Alaska Merit System announces the following positions:

Position	Salary per month
Assistant Commissioner of Health . . . . .	\$500 to \$625
Maternal and Child Health Director . . . . .	380 to 455
Director, Division of Public Health Engineering . . . .	290 to 335
Sanitarian, Senior Grade . .	215 to 245
Sanitarian . . . . .	185 to 215
Bacteriologist, Senior Grade . . . . .	290 to 335
Bacteriologist, Junior Grade . . . . .	215 to 245
Laboratory Technician . . .	185 to 215
Public Health Nurse . . . .	185 to 215

Appointments are being made on a provisional basis with examinations following when the staff is more adequately completed.

Apply to W. H. Matthews, Jr., Alaska Merit System, Box 201, Juneau, Alaska.

### MEDICAL OFFICERS NEEDED—TENNESSEE VALLEY AUTHORITY

The Tennessee Valley Authority is in urgent need of medical officers who are not eligible for military service and who are willing to accept assignments to war industrial activities (construction, manufacture of war chemicals and manufacture of hydroelectric power) as their participation in the all out war effort. Responsibilities include physical examinations, industrial hygiene, care of injuries, med-

ical care to families in remote construction areas and general public health responsibilities in construction camps and villages.

Salary ranges from \$3,200 to \$4,200 per annum with opportunity for promotion.

For further information write to Dr. E. L. Bishop, Director of Health, Tennessee Valley Authority, Chattanooga, Tenn., or to the Personnel Department, Tennessee Valley Authority, Knoxville, Tenn.

FOR OTHER POSITIONS AVAILABLE SEE NOVEMBER AMERICAN JOURNAL OF PUBLIC HEALTH OR WRITE EMPLOYMENT SERVICE, AMERICAN PUBLIC HEALTH ASSOCIATION, 1790 BROADWAY, NEW YORK, N. Y.

#### POSITIONS WANTED

In view of the current active demand for trained and experienced persons in public health it is suggested that prospective employers communicate directly with the Employment Service, American Public Health Association, 1790 Broadway, New York, N. Y., for up-to-date lists of applicants.

#### Advertisement

#### Wanted—Public Health Nurses

(a) Experienced, to carry out generalized public health program and to do such medical work as will meet emergency needs in absence of medical practitioner; some teaching; Alaska; \$2,300; transportation furnished from Seattle; (b) Public health nurse to supervise staff of public health nurses, county district; midwestern college town;

(c) Public health nurse for field position; county population, \$1,500; Midwest; (d) Public health nurse, generalized program, experience in rural public health nursing desirable; Pacific northwest. PH11-1. Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

#### Wanted

(a) Physician for important position, venereal disease program; Islands; must be unmarried or able report without family. (b) County health officer; northern California. (c) Assistant director, school of health, public schools; midwestern metropolis. (d) Woman physician for field position; state department of health; should be effective public speaker; will provide health training if not trained; Midwest. (e) Director; maternal, child, and school hygiene department; pediatric training

desirable; public health experience unnecessary; salary commensurate with qualifications. (f) Physician to direct city-county health unit; work entirely curative; will have two graduate nurses and part-time physician as assistants; college town of 14,000; Southwest. (g) Woman physician to conduct lay educational program in cancer control; considerable traveling; Midwest. PH11-2. Medical Bureau (Burneice Larson, Director), Palmolive Building, Chicago.

#### Situations Wanted

**PUBLIC HEALTH NURSE**—B.S. and Diploma in Nursing, M.S. in Social Administration, Western Reserve University; several years' experience as instructor; eight years, supervisor, public health unit consisting of five counties. For full details, write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

**DENTIST** who has specialized in public health is available; D.D.S., university medical school; several years' private practice; year of postgraduate training in public health hygiene with special emphasis on public health dentistry for which he received degree of M.S.P.H.; several years, state department of health. For further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

**PUBLIC HEALTH PHYSICIAN** is available; degrees from leading schools; several years, field worker, well known foundation; six years' successful administrative experience; eight years, health officer large city in the South; will go anywhere. For further information, please write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

**BACTERIOLOGIST**—B.S., M.D., D.Sc. degrees, with majors in bacteriology; certificate in public health, eastern university; several years' teaching experience, including professorship in bacteriology and pathology; able lecturer; now interested in public health appointment. For full details, write Burneice Larson, Director, Medical Bureau, Palmolive Building, Chicago.

# NEWS FROM THE FIELD

## DRAFT INTERIM REPORT

### *Medical Planning Commission*

A summary of the *Draft Interim Report* of the Medical Planning Commission (*British Medical Journal*, June 20, 1942) has been prepared for the *Journal* by Dr. Michael M. Davis, Chairman of the Committee on Research in Medical Economics, Inc.

To both physicians and laymen it is significant that a body of seventy physicians, which was appointed by the British Medical Association and which has worked for more than a year preparing this preliminary report, recommends a substantial reorganization of medical practice and closer relations of preventive and curative services. The *Report* has recently been considered and its major recommendations approved in principle by the Representative Assembly of the British Medical Association. It is now the subject of discussion in all local branches of the Association and will be revised by the Commission in the near future for official presentation to the profession, the Government, and the British public.

A small minority of the Commission favored a whole-time salaried medical service in which medicine would be put on a basis parallel to education as a function of the state. The majority of the Commission, however, recommended the extension of the national health insurance system (now covering little more than general practitioner service for employed persons) to include the services of specialists, and to cover the dependents of employed persons and other groups, or about 90 per cent of the whole population. This is substantially what the British Medical Association has itself advocated for more than a decade.

Of special interest to public health officers are the recommendations for the organization of medical practice:

"... There is general agreement that co-operation amongst individual general practitioners in a locality is essential to efficient practice under modern conditions, though views vary on the form of the co-operation. The principle of the organization of general practice on a group or co-operative basis is widely approved. A convenient term for the focal point of co-operation is "health centre."

The organization and relationships of the proposed health center system are described in detail. The center would include a much wider scope of work than the district health centers which have been established by American health departments in a number of cities. The medical practice of the locality would be carried on within and from these centers, and from the hospitals with which they would be associated. Each center would be staffed by the local practitioners and affiliated specialists, with an organization corresponding to that of a well planned clinic.

The Commission is practically unanimous in recommending that the voluntary and governmental hospitals should be brought within a single framework of local and regional organization, preserving some autonomy in the management of individual institutions, but coördinating their functions and staffs under a general plan. It will be recalled that, in Britain, the medical officer of health is usually in charge of the local governmental hospital system as well as of the preventive services. Preventive and curative work for industrial employees is touched upon by the Commission and is to be the subject of a subsequent report.

"In view of the fact that the full adoption of the plan may be delayed for several reasons" ... the Commission

suggests three steps for "immediate post war application," namely, the extension of the health insurance system, experimental health centers in some areas, and the creation of regional hospital councils with executive or advisory functions.

#### NEW OFFICERS OF THE AMERICAN SCHOOL HEALTH ASSOCIATION

The following new officers were elected at the business session of the American School Health Association, which was held in St. Louis:

*President*—C. E. Turner, Dr.P.H., Cambridge, Mass.

*President-Elect*—G. Morley Sellery, M.D., Los Angeles, Calif.

*Executive Secretary-Treasurer*—A. O. DeWeese, M.D., Kent, Ohio

*Vice-Presidents*—Arthur E. Turner, M.D., Chicago, Ill.; Gertrude Cromwell, R.N., Des Moines, Iowa.

#### NEW OFFICERS OF THE COLORADO PUBLIC HEALTH ASSOCIATION

At its Annual Meeting held in September, the Colorado Public Health Association elected the following new officers to serve for the forthcoming year.

*President*—John H. Fountain, M.D., Greeley, Colo.

*Vice-President*—Edna Burke, R.N., Denver Colo.

*Secretary*—Evelyn Horton, R.N., Denver, Colo.

*Treasurer*—Virginia Adkins, R.N., Englewood, Colo.

#### COURSE IN INDUSTRIAL MEDICINE ANNOUNCED BY NEW YORK POST-GRADUATE MEDICAL SCHOOL

The Director of the New York Post-Graduate Medical School, New York City, has announced a course on Industrial Medicine for five days, January 11 to 15, 1943, under the direction of Harry J. Johnson, M.D., of the Department of Medicine, assisted by Franklin Carter, M.D., Medical Director, *New York Times*, Walter Dannreuther, M.D., Professor of Clinical Gynecology; Fred B. Flinn, M.D., As-

sociate Professor of Industrial Hygiene; Wilbur Duryea, M.D., Director Vascular Disease Clinic; George Ornstein, M.D., Director Seaview Sanatorium; Henry H. Ritter, M.D., Director Department of Traumatic Surgery; William Irish, M.D., Director Orthopedic Surgery; Charles Poindexter, M.D., Director Department of Cardiology, and Maurice Bruger, M.D., Director of Pathological Chemistry.

The course is planned as an intensive review in industrial medicine and is planned to give basic knowledge of the organization as well as instruction in the administration of an industrial medical department. Lectures and demonstrations will include dust hazards, lead and metal poisonings, industrial dermatoses, the problem of women in industry, industrial absenteeism, prevention of accidents and safety measures.

#### "COMMUNITY ORGANIZATION FOR HEALTH EDUCATION" AVAILABLE

It will be recalled that a Committee of the Public Health Education Section and the Health Officers Section of the American Public Health Association reported in 1941 under the title of Community Organization for Health Education. The purpose was to present significant experiences in community organization for health education which may be helpful to health departments, school systems, and private agencies. Twelve patterns of community organization are described as examples.

This report was prepared and distributed under a grant of the Charles H. Hood Dairy Foundation of Boston, Mass. A large edition was completely exhausted and a second edition has now been made available through the courtesy of the Charles H. Hood Dairy Foundation which will shortly be available at the same cost of 9 cents per single copy postpaid, or c.o.d. if ordered in quantity, charges being only the wrapping costs.



NUTRITION FOUNDATION, INC., NEW  
YORK, MAKES ADDITIONAL  
RESEARCH GRANTS

According to announcement by the Nutrition Foundation in November, 18 additional grants in aid totaling \$46,600 were made, bringing the total of grants to 54 during the current year and including 33 colleges, universities, and medical centers. The present grants include projects at Northwestern University, University of Illinois, Notre Dame, and University of Wisconsin as well as the Universities of Virginia, Arkansas, Stanford, Rochester, Harvard, Cornell, Southern California, California, and the Alabama Polytechnic Institute.

Among the types of new studies supported by the Foundation are the isolation of unstable food factors, protein utilization during partial starvation, studies of radioactive iron, protection of the teeth afforded by specific nutrients, nutritive protection against infection, nutritive value of low-cost vegetables and nutritive protection of the blood vessels.

Contributions to the food industry to support basic research for the next five years were announced at \$1,100,000. Charles Glen King, Ph.D., New York, is Scientific Director of the Foundation.

DR. WILE WILL CONDUCT TRAINING  
COURSE IN SYPHILIS

Udo J. Wile, M.D., Professor of Dermatology and Syphilology at the University of Michigan, Ann Arbor, has been commissioned Medical Director in the U. S. Public Health Service Reserve and has been assigned to active duty in the Division of Venereal Disease Control. According to the announcement, Dr. Wile will conduct a survey of new methods for the intensive treatment of syphilis and will supervise the quarantine hospitals which the Public Health Service and the states are developing in critical war areas. These hospitals are for the treatment of pros-

titutes and recalcitrant persons who are infected with syphilis and who are capable of spreading the disease. It was announced that the first class of physicians, nurses and record analysts would assemble in November at Ann Arbor for an intensive training course under Dr. Wile's direction.

NEW YORK STATE DEPARTMENT OF  
HEALTH PERSONNEL ENTER  
MILITARY SERVICE

Members of the Professional Staff of the New York State Department of Health who have entered military service between May 16 and October 22, 1942:

Hollis Ingraham, M.D., District State Health Officer, Navy  
Robert L. Vought, M.D., Assistant District State Health Officer, Army  
Mark M. Kroll, M.D., Medical Consultant in Social Hygiene, Army  
John K. Miller, M.D., Associate Medical Bacteriologist, Division of Laboratories and Research, Army  
James P. Palmer, M.D., Associate Cancer Gynecologist, State Institute for the Study of Malignant Diseases, Army

*Junior Sanitary Engineers:*

Milton Hill, Army  
Ernest K. Smith, Navy  
Stanley Stolz, Army

*Public Health Nurses:*

Marjorie Chalkley, Army  
Anne Gruschow, Army  
Mary Livingston, WAAC  
Dorothy Peck, Army  
Emma Shaffer, Army  
Madeline Travis, Army  
Norma Zenger, Army

Norman Robbins, Assistant Statistician, Army  
Josephine Cunningham, Junior Statistician,  
WAVES

NEW YORK STATE DEPARTMENT  
PERSONNEL

The U. S. Public Health Service has loaned the New York State Department of Health two physicians, Dr. Edward T. Bloomquist, assigned to the Buffalo District Office, and Dr. Harry J. Schweigert, assigned to Albany.

Health of Toledo, Ohio, and has accepted an appointment as Assistant Medical Director of the National Foundation for Infantile Paralysis, New York, N. Y.

FRANK E. MCCORD, M.D., formerly of Topeka, Ill., has been appointed in charge of the special wartime county health department established for Morgan County, in Jacksonville.

SUMNER M. MILLER, M.D.,\* of Peoria, Ill., has been appointed Defense Zone Health Officer for Peoria County.

JAMES A. OLSON, M.D.,† of Flint, Mich., Director of the Mott Foundation Children's Center and Director of Health for the Flint Public Schools, has been appointed Acting Executive Health Officer of Flint.

CHESTER L. PUTNAM, M.D., M.P.H.,† of Manchester, Ia., has been appointed Director of Local Health Services for the Iowa State Department of Health, effective September 1, succeeding the late MARVIN F. HAYGOOD, M.D.,† of Des Moines.

C. A. SELBY, M.D., of North Platte, Nebr., has been appointed by Governor Dwight Griswold of Nebraska as State Director of Health. He is a Veteran of the Medical Corps of World War I; Past President of the State Medical Association, and a Fellow of the American Medical Association. He has been active in state and civic matters relating to public health. He succeeds A. L. MILLER, M.D.,† who was elected to the U. S. Congress in the recent election in Nebraska, to represent the 4th District.

RAYMOND G. TUCK, M.D., of Royal Oak, Mich., District Health Officer in Southern Oakland County, has been appointed Health Officer of Hazel Park; he will continue to serve as District Health Director.

JOHN P. WALSH, M.D.,† of Greenville,

Ill., has been appointed in charge of the special wartime county health department established for DuPage County, in Wheaton.

#### Eastern States

FREDERICK EBERSON, PH.D., M.D.,\* resigned July 31 from his position of Medical and Research Director, National Drug Company, Philadelphia, Pa., to become Pathologist, Chief of Laboratory Service, U. S. Veterans Administration Facility, Pittsburgh, Pa. He was formerly Pathologist and Director of Laboratories, Gallinger Hospital, Washington, D. C.

LEONARD PARENTE, M.D., M.P.H.,† has been appointed as Medical Director and Adviser for the Connecticut State Department of Public Welfare. Dr. Parente started work in this department on September 1, 1942, and his duties will be those of organizing and administering the State Medical Care Program for the Public Welfare Department of Connecticut.

JOSEPH A. RANDAZZO, M.D.,† has been commissioned as a Passed Assistant Surgeon in the Reserve of the U. S. Public Health Service and has been assigned to the Division of Industrial Hygiene in the Connecticut State Department of Health, Hartford. Dr. Randazzo formerly resided in Bath, Maine.

ALEXANDER H. STEWART, M.D.,† of Harrisburg, Pa., Acting Secretary of the State Board of Health since 1941, and Deputy Secretary from 1939 to 1941, has been appointed Secretary.

#### Southern States

JAMES H. ASHCRAFT, M.D., of Reform, Ala., has been appointed Health Officer of Fayette and Pickens Counties.

DORIS L. A. BALDRIDGE, M.D., of Conway, Ark., has been appointed Health Director of Faulkner County.

\* Fellow A.P.H.A.  
† Member A.P.H.A.

CHARLES B. CRITTENDEN, M.D.,\* of Louisville, Ky., resigned on July 2 as Director of the Division of Maternal and Child Welfare of the Kentucky State Health Department, due to ill health. ALICE D. CHENOWETH, M.D., formerly of Rosemont, Pa., has been named to succeed Dr. Crittenden.

ARTHUR C. CURTIS, M.D., of State Sanatorium, Ark., has been appointed Director of the Division of Tuberculosis Control of the Arkansas State Board of Health.

ALBERT S. DIX, M.D.,† of Opelika, Ala., has been appointed Director of Communicable Disease Control of the Mobile City and County Health Unit, succeeding ISAAC C. SUMNER, M.D.

HOWARD W. ENNES, JR., A.B.,† formerly in charge of venereal disease education for the U. S. Public Health Service, Washington, D. C., is now on duty with the Division of Preventive Medicine, Bureau of Medicine and Surgery of the Navy, as an Ensign H-V(S), USNR. He has been replaced in the U. S. Public Health Service by JUDSON HARDY.

GEORGE SELLERS GRAHAM, JR., M.D., of Birmingham, Ala., has been placed in charge of the health unit in Green County.

EDWIN N. HALLER, M.D., of Mobile, Ala., has been appointed Health Officer for DeKalb County.

HUGH C. HENRY, M.D., of Richmond, Va., Director of State Hospitals, has been appointed Commissioner of Mental Hygiene and Hospitals, a newly created position provided in the state government reorganization act, effective July 1.

EDWARD M. HOLMES, JR., M.D., M.P.H.,\* for several years Director of the Division of Venereal Disease Control of the Virginia State Department of Health, Richmond, has been

assigned as Venereal Disease Control Officer at Randolph Field, Tex. WALLACE E. BAKER, M.D., of Petersburg, assistant to Dr. Holmes, has been named Acting Director of the Division of Venereal Disease Control for the duration.

WILLIAM R. KELSAY, M.D.,† of Monticello, Ky., has been named Health Officer for Clinton and Cumberland Counties in addition to Wayne County. He succeeds PAUL D. MOORE, M.D., of Albany, who has been transferred to Casey County, where he succeeds JAMES T. DUNCAN, M.D.,† formerly of Columbia who has gone to Charleston, W. Va.

ALEX C. MCDUGAL, M.D., of Savannah, Tenn., is the new Health Officer of Marengo County.

JAMES O. NALL, M.D.,† of Marion, Ky., has resigned as Health Officer of Livingston County to accept a District appointment in Crittenden, Caldwell, and Lyon Counties. He has also resigned as secretary of the Livingston County Medical Society. The health unit has been combined with the one in Marshall County, with SAMUEL L. HENSON, M.D., of Benton, as full-time Health Officer.

ANTHONY P. RUBINO, M.D., formerly of Key West, Fla., of the U. S. Public Health Service, has been appointed Medical Officer in Charge of the United States Marine Hospital, Memphis, Tenn. He succeeds EDWIN H. CARNES, M.D., who was transferred to Alaska. Dr. Rubino has been a member of the Public Health Service since 1926.

JACOB LELAND TANNER, M.D., of Henderson, Ky., has been appointed Health Officer of Washington County.

DONALD B. THURBER, M.D., of Carlisle, Ky., has been appointed Director of the Tri County Health District consisting of Trimble, Carroll, and Gallatin Counties.

WALTER E. WILKINS, M.D., of Raleigh,

\* Fellow A.P.H.A.  
† Member A.P.H.A.

N. C., Director of the Division of School Health Service for the North Carolina State Board of Health, has been made Consultant in Nutrition to the Office of Defense Health and Welfare Services in Washington.

#### Western States

LUNSFORD D. FRICKS, M.D., of Seattle, Wash., has been appointed Health Officer of the Helena and Lewis and Clark Counties Health Unit, succeeding LEO F. HALL, M.D., of Helena, who has resigned on account of ill health.

WILLIAM L. JACKSON, M.D., of Burlington, Wash., has been named Health Officer of Skagit, to succeed WILLIAM V. KING, M.D., JR.

GUY W. KENNICOTT, M.D., has resigned as Health Officer of Chehalis, Wash.

PHILIP D. KETCHUM, M.D., Health

Officer of Laramie County, was recently appointed Health Officer of Cheyenne, Wyo., succeeding WALTER S. KOTAS, M.D.,† who entered Army service.

DORSEY S. LENZ, M.D., formerly of Edgerton, Wyo., has been appointed Health Officer of Campbell County.

EMIL E. PALMQUIST, M.D.,† of Port Angeles, Wash., Health Officer of Clallam County-City Health Unit, was elected the President of the Washington State Public Health Association at its recent annual meeting.

#### DEATHS

DR. HORTON CASPARIS, of Nashville, Tenn., died suddenly during the week of November 8, at the age of 51.

S. S. GOLDWATER, M.D.,\* formerly Commissioner of Hospitals of the City of New York, died October 22, at the age of 69.

### CONFERENCES AND DATES

American Association for the Advancement of Science. New York, N. Y. December 28-January 2.

American Association of State Highway Officials. St. Louis, Mo. December 7-9.

American Association of School Administrators. St. Louis, Mo. February 26-March 2, 1943.

American Library Association—Midwinter Conference. Chicago, Ill. December 28-31.

American Public Welfare Association. Baltimore, Md. December 11-13 (tentative).

American Society for Public Administra-

tion. Chicago, Ill. December 27-28.

American Society of Anesthetists. New York, N. Y. December 10.

American Standards Association. New York, N. Y. December 10.

American Statistical Association. Cleveland, Ohio. December 29-31.

American Society of Civil Engineers—Winter Meeting. New York, N. Y. January 19-22, 1943.

American Water Works Association—New York Section—Mid-Winter Meeting.

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# American Journal of Public Health

## and THE NATION'S HEALTH

### Index of Volume 32, 1942

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Articles, committee reports, and editorials are listed alphabetically according to the key words in the title, with many cross-references.

Editorials are indexed under "Editorials" as well as alphabetically under the key words in the title.

News notes and fillers are indexed under "News from the Field." This section should be searched as supplemental to the title index.

Matters pertaining to the Association are indexed under "American Public Health Association" and "Year Book."

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